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
```

```
F 1
**FILE**ID**PAFPCALL                                                                P
                                                                                    V

PPPPPPPP      AAAAAA    FFFFFFFFFF  PPPPPPPP      CCCCCCCC    AAAAAA    LL          LL
PPPPPPPP      AAAAAA    FFFFFFFFFF  PPPPPPPP      CCCCCCCC    AAAAAA    LL          LL
PP      PP  AA      AA  FF          PP      PP  CC          AA      AA  LL          LL
PP      PP  AA      AA  FF          PP      PP  CC          AA      AA  LL          LL
PP      PP  AA      AA  FF          PP      PP  CC          AA      AA  LL          LL
PP      PP  AA      AA  FF          PP      PP  CC          AA      AA  LL          LL
PPPPPPPP    AA      AA  FFFFFFFF    PPPPPPPP    CC          AA      AA  LL          LL
PPPPPPPP    AA      AA  FFFFFFFF    PPPPPPPP    CC          AA      AA  LL          LL
PP          AAAAAAAAAA  FF          PP          CC          AAAAAAAAAA  LL          LL
PP          AAAAAAAAAA  FF          PP          CC          AAAAAAAAAA  LL          LL
PP          AA      AA  FF          PP          CC          AA      AA  LL          LL              ....
PP          AA      AA  FF          PP          CC          AA      AA  LL          LL              ....
PP          AA      AA  FF          PP            CCCCCCCC  AA      AA  LLLLLLLLLL  LLLLLLLLLL      ....
PP          AA      AA  FF          PP            CCCCCCCC  AA      AA  LLLLLLLLLL  LLLLLLLLLL      ....

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  PAFPCALL
0000          .IDENT  'V04-001'
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:  SCS ROUTINES AVAILABLE TO FORK PROCESSES WHICH
0000  ;            ARE CI PORT-SPECIFIC.
0000  ;
0000  ; AUTHOR:  N. KRONENBERG,  MAY 1981
0000  ;
0000  ; MODIFIED BY:
0000  ;
0000  ;       V04-001 NPK3066         N. Kronenberg           9-Sep-1984
0000  ;               Upon deallocation of a message buffer that results
0000  ;               in the decision to extend more credit, bypass call
0000  ;               to SCS$REQ_SCSSEND to extend credit if the CDT state
0000  ;               shows that the SYSAP has done a DISCONNECT.  (Formerly
0000  ;               the SCS$REQ_SCSSEND call was bypassed iff the CDT was
0000  ;               actually queued for SCS sending already.  This is
0000  ;               incorrect since it would allow a credit to be extended
0000  ;               after the DISCONNECT_REQUEST was sent.)
0000  ;               RSPID mismatch on completion of a block transfer
0000  ;               (RD_SEQ_ERR) corrected to back msg pointer up by
0000  ;               PPD header length prior to crashing port.
0000  ;
0000  ;       V03-025 NPK3054         N. Kronenberg           24-Jun-1984
0000  ;               Since SCS$REQ_SCSSEND will now ensure that a CDT
0000  ;               will not be queued on the SCS send buffer wait queue
0000  ;               if it is already waiting, change DISCONNECT from the
0000  ;               open state not to check for this condition.  The
```

```
0000   ;              check is being moved to SCS$REQ_SCSSEND because there
0000   ;              were several other conditions that required the check
0000   ;              that were not making it and that could corrupt the
0000   ;              wait queue.
0000   ;
0000   ;      V03-024 NPK3047         N. Kronenberg           22-Mar-1984
0000   ;              Add FPC$STOP_VCS entry to send host shutdowns to
0000   ;              to all vcs on shutdown or bugcheck.
0000   ;
0000   ;      V03-023 NPK3048         N. Kronenberg           16-Mar-1984
0000   ;              Fix FPC$SNDCNTMSG to set retflag=true by putting
0000   ;              1 in R0 instead of SYSAP$C_DISPPO.
0000   ;
0000   ;      V03-022 NPK3046         N. Kronenberg            7-Mar-1984
0000   ;              Improve comments for FPC$READCOUNT.
0000   ;
0000   ;      V03-021 TMK0002         Todd M. Katz            21-Feb-1984
0000   ;              Change FPC$INITIAL so that the buffer descriptors are allocated
0000   ;              by calling EXE$ALONONPAGED instead of INI$HIPALC. This can be
0000   ;              done because this routine is now being called at fork IPL
0000   ;              instead of at IPL$_POWER.
0000   ;
0000   ;      V03-020 TMK0001         Todd M. Katz            29-Jan-1984
0000   ;              Fix an error path for the MRESET and MSTART fork process
0000   ;              calls. In both cases when the appropriate PPD action routine
0000   ;              returns an error, the error path that is taken does a PUSHR of
0000   ;              R0 (instead of a PUSHL) to save the return status over the
0000   ;              datagram buffer deallocation. This PUSHR results in the stack
0000   ;              being corrupted in a variety of interesting fashions depending
0000   ;              upon the error code that is residing in R0.
0000   ;
0000   ;      V03-019 NPK3039         N. Kronenberg           11-Jan-1984
0000   ;              On receipt of DATREC, CNFREC return the response msg
0000   ;              to pool unconditionally.  Previously it was returned
0000   ;              to the msg free queue if that queue was not up to
0000   ;              the initial receive credit and this could cause credits
0000   ;              to build without bound.
0000   ;              Fix RD_SEQ_ERR and SC_SEw_ERR to first look up the
0000   ;              PB (if any) associated with the response in hand, and
0000   ;              then branch to INT$/RSP_CRASH_PORT which expects R1
0000   ;              to have the PB address or 0 if no PB.
0000   ;
0000   ;      V03-018 NPK3037         N. Kronenberg           11-Nov-1983
0000   ;              Add $DEBUGCHECK on block xfer XCTID sequence number
0000   ;              error and source conid sequence number error.
0000   ;              Fix source connection id check to not delete a sent
0000   ;              message twice.
0000   ;
0000   ;      V03-017 NPK3036         N. Kronenberg           21-Oct-1983
0000   ;              Correct bug in stack management in FPC$MSTART.
0000   ;
0000   ;      V03-016 NPK3034         N. Kronenberg           13-Sep-1983
0000   ;              Fix stepping count of number of bytes mapped to add
0000   ;              from byte count pointed to by R1 rather than IRP.
0000   ;
0000   ;      V03-015 NPK3029         N. Kronenberg           14-Jul-1983
0000   ;              Enhancements for V4.0.
```

```
0000    ;               Set local/remote process names in scs msg attached to
0000    ;               CDT when connect is issued rather than waiting for accept.
0000    ;               Add per connection performance counters.
0000    ;               Correct benign bug in msg deallocation in deciding
0000    ;               whether to return buffer to pool or free queue.
0000    ;               In FPC$SNDCNTMSG with no rspid decide if port should
0000    ;               put sent buffer on free queue before sending it.
0000    ;               Add new entry FPC$SNDRGDG to send a dg without a CDRP.
0000    ;               Remove NPK3026 since it is taken care of by zeroing
0000    ;               CDRP$L_MSG_BUF at the time the block xfer is started.
0000    ;
0000    ;       V03-014 NPK3026         N. Kronenberg           18-May-1983
0000    ;               Fix FPC$REC_CNFREC/DATREC to zero CDRP$L_MSG_BUF.
0000    ;
0000    ;               NPK3025         N. Kronenberg           18-May-1983
0000    ;               Fix the fix to insufficient memory on ACCEPT call.
0000    ;
0000    ;       V03-013 KTA3046         Kerbey T. Altmann       28-Mar-1983
0000    ;               Redo for SCS/PPD split.
0000    ;
0000    ;       V03-012 NPK3017         N. Kronenberg           28-Feb-1983
0000    ;               Fix R0 destroyed on READ counters busy.
0000    ;
0000    ;       V03-011 NPK3016         N. Kronenberg           28-Feb-1983
0000    ;               Fix insufficient dg/msg buffers on ACCEPT call.
0000    ;
0000    ;       V03-010 NPK3010         N. Kronenberg           11-Nov-1982
0000    ;               Invoke $SYSAPDEF.  Add dg disposal flag value assumes.
0000    ;               Fix insfmem path in FPC$MSTART.
0000    ;
0000    ;       V03-009 NPK3009         N. Kronenberg            2-Nov-1982
0000    ;               Zero application dg credit field.
0000    ;
0000    ;       V03-008 NPK3008         N. Kronenberg            6-Oct-1982
0000    ;               Change disconnect on CDT in illegal state to crash
0000    ;               the VC instead of returning error status to caller
0000    ;               and doing nothing.  Change disconnect on CDT in
0000    ;               disc_ack state to crash VC instead of simple unilateral
0000    ;               break of connection.
0000    ;
0000    ;       V03-007 NPK3007         N. Kronenberg            5-Oct-1982
0000    ;               Fixed bug in MAP which incorrectly saved the context
0000    ;               of multiple buffer descriptor waiters.
0000    ;
0000    ;       V03-006 NPK3006         N. Kronenberg            9-Sep-1982
0000    ;               Fixed bug in waiting for buffer descriptor.
0000    ;
0000    ;       V03-005 KDM0002         Kathleen D. Morse       28-Jun-1982
0000    ;               Added $DYNDEF, $DCDEF, $PRDEF, and $SSDEF.
0000    ;
0000    ;       V03-004 NPK3002         N. Kronenberg            1-Jul-1982
0000    ;               Fix ACCEPT to return correct status in R0 on
0000    ;               insufficient memory and to preserve addr of listen
0000    ;               CDT.
0000    ;
0000    ;
0000    ;--
```

```
    0000            .SBTTL  DEFINITIONS
    0000
    0000    ;
    0000    ; Set PSECT to driver code:
    0000    ;
    0000
00000000            .PSECT  $$$115_DRIVER,LONG
    0000
    0000    ;
    0000    ; System definitiors (LIB.MLB):
    0000    ;
    0000
    0000            .nocross
    0000            $CDLDEF                         ; Connection descriptor list
    0000            $CDRPDEF                        ; Class driver request packet format
    0000            $CDTDEF                         ; Connection descriptor format
    0000            $CIBDDEF                        ; CI buffer descriptor format
    0000            $CIBDUTDEF                      ; CI ouffer desc table format
    0000            $CIBHANDEF                      ; CI buffer handle format
    0000            $DYNDEF                         ; Dynamic block codes
    0000            $IRPD':F                        ; Define IRP offsets and bits
    0000            $PBDEF                          ; Path Block format
    0000            $PDTDEF                         ; Port descriptor format
    0000            $PRDEF                          ; Define processor register definitions
    0000            $RDDEF                          ; Response descriptor format
    0000            $RDTDEF                         ; Response descriptor list
    0000            $SCSDEF                         ; SCS message format
    0000            $SSDEF                          ; System-wide status codes
    0000            $SYSAPDEF                       ; Send/recv dg flags
    0000            .cross
```

```
                             0000          .SBTTL  UNIMPLEMENTED FORK PROCESS CALLS
                             0000
                             0000     FPC$MAINTFCN::
                             0000
         50   00F4 8F    3C  0000          MOVZWL  #SS$_ILLIOFUNC,R0       ; Set error status for caller
                         05  0005          RSB                             ; Return to caller
```

```
0006          .SBTTL  CONNECTION MANAGEMENT CALLS
0006          .SBTTL  -       FPC$CONNECT,    COMPLETE PROCESSING A CONNECT
0006
0006    ;+
0006    ; This routine is JMP'ed to from SCS$CONNECT with a CDT allocated
0006    ; (and in the closed state) and initialized with the SYSAP's
0006    ; connect parameters or 0's for fields not yet used.  FPC$CONNECT
0006    ; does port-specific processing:  allocates SCS control message
0006    ; receive buffer, initial credit worth of receive message buffers,
0006    ; and initial datagram buffers.  FPC$CONNECT then sets the CDT
0006    ; state to connect sent and queues the CDT to send a CONNECT_REQ
0006    ; message to the remote system.  Finally, FPC$CONNECT suspends the
0006    ; SYSAP.
0006    ;
0006    ; Inputs:
0006    ;
0006    ;       R3                      -Addr of CDT
0006    ;       R4                      -Addr of PDT
0006    ;
0006    ;       CDT initialized as follows:
0006    ;
0006    ;       CDT$L_LCONID            -Local conid
0006    ;             MSGINPUT          -Addr to call in SYSAP for rec'd msgs
0006    ;             DGINPUT           -Addr to call in SYSAP for rec'd dgs
0006    ;             ERRADDR           -Addr to call in SYSAP for connection errors
0006    ;             RSTATION          -Remote station addr
0006    ;             PDT               -Addr of PDT
0006    ;             MINSEND           -Minimum send credit req'd by SYSAP
0006    ;             INITLREC          -Initial credit extended by SYSAP
0006    ;             DGREC             -Initial # of dg's queued
0006    ;             STATE             -CLOSED
0006    ;             PB                -Addr of selected PB to remote system
0006    ;             WAITQFL/BL        -Set to show no entries
0006    ;             RPROCNAM          -Addr of dest process name
0006    ;             LPROCNAM          -Addr of local process name
0006    ;             CONDAT            -Addr of connect data
0006    ;
0006    ;       other CDT fields        -0
0006    ;
0006    ;
0006    ;       (SP)                    -Return PC in SYSAP
0006    ;
0006    ; Outputs:
0006    ;
0006    ;       R0                      -Status:  SS$_NORMAL, SS$_FAILRSP,
0006    ;                                         SS$_REJECT, SS$_INSFMEM
0006    ;       R1                      -Reject reason or fail response reason
0006    ;                                if R0 = REJECT or FAILRSP
0006    ;       R2                      -Addr of ACCEPT_REQ if R0 = success
0006    ;       other registers         -Preserved
0006    ;-
0006
0006          .ENABL  LSB
0006
0006    FPC$CONNECT::
0006
0006          $CHK_CDTSTATE -                 ; Verify that CDT state
```

```
                          0006   268                      CLOSED,-               ;  is closed;  if not,
                          0006   269                      ERROR=STATE_ERR        ;  caller made error
          FFEE'   30      000F   270              BSBW    SCS$ALL_ALLBUF         ; Allocate all buffers needed
          32 50   E9      0012   271              BLBC    R0,CON_MEM_FAIL        ; Branch if failed
52     2C A3      D0      0015   272              MOVL    CDT$L_SCSMSG(R3),R2    ; Get addr of SCS receive buffer
50     54 A3      D0      0019   273              MOVL    CDT$L_LPROCNAM(R3),R0  ; Copy local process name
04 A2     80      7D      001D   274              MOVQ    (R0)+,SCS$T_DST_PROC(R2);  into SCS recv buffer as destination
0C A2     80      7D      0021   275              MOVQ    (R0)+,SCS$T_DST_PROC+8(R2)
50     50 A3      D0      0025   276              MOVL    CDT$L_RPROCNAM(R3),R0  ;  process and remote process name
14 A2     80      7D      0029   277              MOVQ    (R0)+,SCS$T_SRC_PROC(R2);  as source process.  Allows SHOW
1C A2     8C      7D      002D   278              MOVQ    (R0)+,SCS$T_SRC_PROC+8(R2)
                          0031   279                                             ;  CLUSTER to report process names
                          0031   280                                             ;  for incomplete connect calls
50     1C A3      D0      0031   281              MOVL    CDT$L_PB(R3),R0        ; Get path block addr for CDT
       34 A0      D0      0035   282              MOVL    PB$L_CDTLST(R0),-      ; Link this new CDT onto
       6C A3              0038   283                      CDT$L_CDTLST(R3)       ;  the head of the CDT list
34 A0     53      DC      003A   284              MOVL    R3,PB$L_CDTLST(R0)     ;  for this path
          07      B0      003E   285              MOVW    #CDT$C_CON_SENT,-      ; Move CDT state to
       28 A3              0040   286                      CDT$W_STATE(R3)        ;  connect sent
   50     01      3C      0042   287              MOVZWL  #CDT$C_CON_PEND,R0     ; Get block state
          69      11      0045   288              BRB     SCSSEND                ; Ask to send CONNECT_REQ & suspend
                          0047   289
                          0047   290 CON_MEM_FAIL:
                          0047   291
          50      DD      0047   292              PUSHL   R0                     ; Save error status
                          0049   293
                          0049   294 CON_MEM_FAIL1:
                          0049   295
00000000'GF       16      0049   296              JSB     G^SCS$DEALL_CDT        ; Deallocate CDT
          50    8ED0      004F   297              POPL    R0                     ; Retreive status
                  05      0052   298              RSB                            ; Return error to SYSAP
                          0053   299
                          0053   300              .DSABL  LSB
```

```
0053          .SBTTL  -       FPC$ACCEPT,     COMPLETE PROCESSING AN ACCEPT
0053
0053    ;+
0053    ; This routine is JMP'ed to by SCS$ACCEPT which allocates and inits
0053    ; a CDT on which the connection is to be completed.  FPC$ACCEPT
0053    ; allocates the SCS receive buffer, message buffers, and datagram
0053    ; buffers the new connection will need and requests the SCS send
0053    ; process to send an ACCEPT_REQ message to the remote system.
0053    ; Finally, the SYSAP is suspended until the ACCEPT_RSP is received.
0053    ;
0053    ; Inputs:
0053    ;
0053    ;       R2                      -Addr of listening CDT
0053    ;       R3                      -Addr of accepting CDT
0053    ;       R4                      -Addr of PDT
0053    ;
0053    ;       Listening CDT:
0053    ;
0053    ;       CDT$W_STATE             -Connect received state
0053    ;       CDT$L_SCSMSG            -Addr of message buffer containing CONNECT_REQ
0053    ;       CDT$L_PB                -Path Blk of connect request
0053    ;       CDT$B_RSTATION          -Remote station addr of connect req
0053    ;       CDT$L_PDT               -PDT of connect request
0053    ;
0053    ;       Accepting CDT:          -All fields zeroed except:
0053    ;                                MSGINPUT,DGINPUT,ERRADDR,MINSENT,
0053    ;                                INITLREC, and DGREC as specified
0053    ;                                by SYSAP;
0053    ;                                LCONID, SIZE, TYPE, SUBTYP, WAITQFL
0053    ;                                and WAITQBL
0053    ;
0053    ; Outputs (upon resumption of SYSAP):
0053    ;
0053    ;       R0                      -Status:  SS$_NORMAL, SS$_INSFMEM
0053    ;       R1                      -Destroyed
0053    ;       R2                      -Preserved if R0/SS$_INSFMEM; Else destroyed
0053    ;       Other registers         -Preserved
0053    ;
0053    ;       Listening CDT:
0053    ;
0053    ;       CDT$W_STATE             -LISTEN state
0053    ;
0053    ;       Accepting CDT:          -All fields initialized
0053    ;
0053    ;-
0053
0053    ;
0053    ; CDT adjacency assumptions:
0053    ;
0053
0053    ASSUME  CDT$L_PB+4  EQ CDT$B_RSTATION
0053
0053          .ENABL  LSB
0053
0053    FPC$ACCEPT::
0053
0053          $CHK_CDTSTATE -                 ; Verify that accepting CDT
```

```
                        0053    359                   CLOSED,-                  ;  state is closed;  if not,
                        0053    360                   ERROR=STATE_ERR           ;  caller made error
    10 A3   54     D0   005C    361          MOVL     R4,CDT$L_PDT(R3)          ; Set PDT addr in accepting CDT
       1C A2       7D   0060    362          MOVQ     CDT$L_PB(R2),-            ; Copy from listener CDT to accepting:
       1C A3            0063    363                   CDT$L_PB(R3)              ;  PB addr, remote station, l.o.,
       24 A2       B0   0065    364          MOVW     CDT$B_RSTATION+4(R2),-    ;  remote station, h.o. 2 bytes
       24 A3            0068    365                   CDT$B_RSTATION+4(R3)      ;
    50  1C A2      D0   006A    366          MOVL     CDT$L_PB(R2),R0           ; Get path blk addr of connect
                        006E    367                                             ;  request that was saved in listener
       34 A0       D0   006E    368          MOVL     PB$L_CDTLST(R0),-         ; Link the new CDT to the
       6C A3            0071    369                   CDT$L_CDTLST(R3)          ;  head of the CDT list
    34 A0   53     D0   0073    370          MOVL     R3,PB$L_CDTLST(R0)        ;  for this path
       50   52     D0   0077    371          MOVL     R2,R0                     ; Save listening CDT addr temporarily
    52  2C A2      D0   007A    372          MOVL     CDT$L_SCSMSG(R2),R2       ; Get addr of CONNECT_REQ msg
        2C A0      D4   007E    373          CLRL     CDT$L_SCSMSG(R0)          ; Zero listener scs recv buffer addr
    F8 A2   50     D0   0081    374          MOVL     R0,SCS$L_DST_CONID(R2)    ; Save listening CDT addr in msg
            50     DD   0085    375          PUSHL    R0                        ;  and save on stack also
    2C A3   52     D0   0087    376          MOVL     R2,CDT$L_SCSMSG(R3)       ; Put msg addr in accepting CDT
         FF72'     30   008B    377          BSBW     SCS$COPY_ACCP             ; Copy credit, RCONID info from
                        008E    378                                             ;  CONNECT_REQ  to accepting CDT
       14 A2       DE   008E    379          MOVAL    SCS$T_SRC_PROC(R2),-      ; Set addr of remote proc name
       50 A3            0091    380                   CDT$L_RPROCNAM(R3)        ;
       04 A2       DE   0093    381          MOVAL    SCS$T_DST_PROC(R2),-      ;  and local proc name in CDT
       54 A3            0096    382                   CDT$L_LPROCNAM(R3)        ;  for later xmit of ACCEPT_REQ
         FF65'     30   0098    383          BSBW     SCS$ALL_ALLBUF2           ; Allocate all msg and dg buffers
            52   8ED0   009B    384          POPL     R2                        ; Retreive listener CDT address
       08 50       E8   009E    385          BLBS     R0,10$                    ; Branch if got them
            50     DD   00A1    386          PUSHL    R0                        ; Else save error status
         FF5A'     30   00A3    387          BSBW     SCS$DEAL_SCSREC           ; Deallocate extra SCS recv buffer
         FFA0      31   00A6    388          BRW      CON_MEM_FAIL1             ; Clean up accepting CDT (status on stack)
                        00A9    389
            0A     B0   00A9    390 10$:     MOVW     #CDT$C_ACCP_SENT,-        ; Move state to accept sent
         28 A3          00AB    391                   CDT$W_STATE(R3)           ;
      50    02     3C   00AD    392          MOVZWL   #CDT$C_ACCP_PEND,R0       ; Set block state to accept pending
                        00B0    393
                        00B0    394 SCSSEND:
         FF4D'     30   00B0    395          BSBW     SCS$REQ_SCSSEND           ; Ask to send ACCEPT_REQ
         04B2      31   00B3    396          BRW      SUSP_CONCALL              ; Suspend SYSAP connection call
                        00B6    397
                        00B6    398          .DSABL   LSB
```

```
                          00B6          .SBTTL  -       FPC$REJECT,     PROCESS A REJECT CALL
                          00B6
                          00B6     ;+
                          00B6     ; FPC$REJECT is called directly from the SYSAP.  It requests
                          00B6     ; the SCS send process to send a REJECT_REQ message with SYSAP-
                          00B6     ; specified reject reason.  FPC$REJECT then suspends the SYSAP
                          00B6     ; until the reject response arrives.
                          00B6     ;
                          00B6     ; Inputs:
                          00B6     ;
                          00B6     ;       R0                      -Reject reason (l.o. 16 bits)
                          00B6     ;       R3                      -Addr of CDT (listening CDT)
                          00B6     ;       R4                      -Addr of PDT
                          00B6     ;
                          00B6     ;       CDT$L_SCSMSG            -Addr of msg buffer containing CONNECT_REQ
                          00B6     ;
                          00B6     ; Outputs (upon resumption of SYSAP):
                          00B6     ;
                          00B6     ;       R0                      -SS$_NORMAL, SS$_ILLCDTST
                          00B6     ;       R1,R2                   -Destroyed
                          00B6     ;       other registers         -Preserved
                          00B6     ;
                          00B6     ;       CDT$W_STATE(R3)         -Connect rec'd --> listen
                          00B6     ;-
                          00B6
                          00B6          .ENABL  LSB
                          00B6
                          00B6     FPC$REJECT::
                          00B6
                          00B6          $CHK_CDTSTATE -                 ; Verify CDT state is
                          00B6                  CON_REC,-               ;  connect received;  if not,
                          00B6                  ERROR=STATE_ERR         ;  caller made error
           FF3E'   30     00BF          BSBW    SCS$MAP_VMSSTS          ; Map VMS status to SCS
     26 A3    50   B0     00C2          MOVW    R0,CDT$W_REASON(R3)     ; Save reject reason
              0B   B0     00C6          MOVW    #CDT$C_REJ_SENT,-       ; Move CDT state to reject sent
          28 A3           00C8                  CDT$W_STATE(R3)         ;
       50     03   3C     00CA          MOVZWL  #CDT$C_REJ_PEND,R0      ; Set block state = reject pending
              E1   11     00CD          BRB     SCSSEND                 ; Ask to send REJECT_REQ & suspend
                          00CF
                          00CF          .DSABL  LSB
```

```
00CF            .SBTTL  -       FPC$DCONNECT,   PROCESS A DISCONNECT CALL
00CF
00CF    ;+
00CF    ; FPC$DCONNECT is called by the SYSAP.  It may be called from
00CF    ; three states.  Depending upon the state, the following actions
00CF    ; are taken:
00CF    ;
00CF    ;       STATE           ACTIONS                 NEW STATE
00CF    ;
00CF    ;       CLOSED          No action; return success to the SYSAP,
00CF    ;                       SS$ALRDYCLOSED.
00CF    ;
00CF    ;       OPEN            Trade DISCONNECT's with the remote SYSAP.
00CF    ;                       When the trade is done, return success to
00CF    ;                       the SYSAP.  The state changes seen by the
00CF    ;                       side initiating the DISCONNECT are:
00CF    ;                       OPEN-->DISC_SENT-->DISC_ACK-->CLOSED.
00CF    ;                       The state changes seen by the passive side are:
00CF    ;                       OPEN-->DISC_REC-->DISC_MTCH-->CLOSED.
00CF    ;                       If both sides initiate a DISCONNECT
00CF    ;                       simultaneously, so that the requests cross
00CF    ;                       in the mail, then each side sees the
00CF    ;                       following state transitions:
00CF    ;                       OPEN-->DISC_SENT-->DISC_MTCH-->CLOSED.
00CF    ;
00CF    ;       CON_ACK,        Unilaterally deallocate CDT and associated
00CF    ;       DISC_ACK        receive buffers.  Complete original
00CF    ;                       outstanding CONNECT/DISCONNECT with abort
00CF    ;                       status, SS$_ABORT.  Return success on the
00CF    ;                       DISCONNECT call.
00CF    ;
00CF    ;       CON_REC         Do a REJECT.
00CF    ;
00CF    ;       DISC_REC        Send out a DISCONNECT (part of the normal
00CF    ;                       handshake discussed for OPEN.)  The
00CF    ;                       DISCONNECT request is sent on the lowest
00CF    ;                       priority queue to delay it till all other
00CF    ;                       pending traffic, including block transfers,
00CF    ;                       is done.  A credit message is forced out
00CF    ;                       first in order to make sure the remote
00CF    ;                       knows about all the credits we have to extend.
00CF    ;
00CF    ;       Other states    All other states represent the window
00CF    ;                       between sending an SCS request and getting
00CF    ;                       the response.  During this window the CDT
00CF    ;                       cannot be unilaterally destroyed and so
00CF    ;                       error status SS$_ILLCDTST is returned to
00CF    ;                       the SYSAP.
00CF    ;
00CF    ;       Inputs:
00CF    ;
00CF    ;               R0                      -Disconnect reason
00CF    ;               R3                      -Addr of CDT being disconnected
00CF    ;               R4                      -Addr of PDT
00CF    ;
00CF    ;       Outputs:
00CF    ;
```

```
                   00CF  ;                 R0                      -Status:  SS$_NORMAL, SS$_ILLCDTST
                   00CF  ;                 R1,R2,R3                -Destroyed
                   00CF  ;                 Other registers         -Preserved
                   00CF  ;-
                   00CF
                   00CF          .ENABL  LSB
                   00CF
                   00CF  FPC$DCONNECT::
                   00CF
51   1C A3    D0   00CF          MOVL    CDT$L_PB(R3),R1         ; Get PB addr
     12 A1    B1   00D3          CMPW    PB$W_STATE(R1),-        ; Is path in either
   8000 8F         00D6                  #PB$C_VC_FAIL           ;  virtual circuit fail or
       03     12   00D9          BNEQ    2$                      ;
     FF22'    31   00DB          BRW     SCS$DISC_VCFAIL         ;
                   00DE
     12 A1    B1   00DE  2$:     CMPW    PB$W_STATE(R1),-        ;  power fail state?
   4000 8F         00E1                  #PB$C_PWR_FAIL          ;
       03     12   00E4          BNEQ    3$                      ;
     FF17'    31   00E6          BRW     ERR$DISC_PWFAIL         ; If so, call different DISCONNECT
                   00E9
                   00E9  3$:     $DISPATCH -
                   00E9                  CDT$W_STATE(R3),-                ; Dispatch on CDT state:
                   00E9                  <-                               ;  (CLOSED/LISTEN handled by SCSLOA)
                   00E9                  <CDT$C_OPEN,    DISC_OPEN>,-     ;  OPEN,
                   00E9                  <CDT$C_CON_ACK, DISC_CON_ACK>,- ;  CON_ACK,
                   00E9                  <CDT$C_DISC_ACK,DISC_ILLSTATE>,-;  DISC_ACK,
                   00E9                  <CDT$C_CON_REC, FPC$REJECT>,-    ;  CON_REC,
                   00E9                  <CDT$C_DISC_REC,DISC_DISC_REC>,-;  DISC_REC,
                   00E9                  <CDT$C_CON_SENT,DISC_ILLSTATE>,-;  CON_SENT,
                   00E9                  <CDT$C_DISC_SENT,DISC_ILLSTATE>,- ;  DISC_SENT,
                   00E9                  <CDT$C_REJ_SENT,DISC_ILLSTATE>,-;  REJ_SENT,
                   00E9                  <CDT$C_ACCP_SENT,DISC_ILLSTATE>,- ;  ACCP_SENT
                   00E9                  <CDT$C_DISC_MTCH,DISC_ILLSTATE>,- ;  Matching DISC sent
                   00E9                   >                               ;  (CDT$C_VC_FAIL went to SCS$DISC
                   0102
                   0102          BUGCHECK  CIPORT,NONFATAL       ; If none of the above
                   0109                                          ;  states, system error,
                   0109                                          ;  possibly recoverable
   50    01   3C   0109          MOVZWL  #SS$_NORMAL,R0          ; If bugcheck nonfatal, return
              05   010C          RSB                             ;  success to SYSAP
                   010D
                   010D  ;
                   010D  ; Connection can't be closed right now without violating SCS protocol.
                   010D  ; Therefore close unilaterally and crash VC.
                   010D  ;
                   010D
                   010D  DISC_ILLSTATE:
                   010D
      1C A3   DD   010D          PUSHL   CDT$L_PB(R3)            ; Save PB addr
         0A   10   0110          BSBB    DISC_CON_ACK            ; Cleanup CDT and pending
                   0112                                          ;  CONNECT/DISCONNECT
        51 8ED0    0112          POPL    R1                      ; Retreive PB address
      FEE8'   30   0115          BSBW    ERR$CRASHVC             ; Initiate VC crash
   50    01   3C   0118          MOVZWL  #SS$_NORMAL,R0          ; Set status to return to caller
                   011B                                          ;  on latest DISCONNECT call
              05   011B          RSB                             ; Return error to SYSAP
                   011C
```

```
                                011C  ;
                                011C  ; CDT has a CONNECT or DISCONNECT request already pending.  Unilaterally
                                011C  ; clean up the CDT.  Complete pending request with abort status.
                                011C  ; Complete this DISCONNECT with success.
                                011C  ;
                                011C
                                011C  DISC_CON_ACK:
                                011C
         7E    54     7D  011C              MOVQ    R4,-(SP)                ; Save R4, R5
     55   68 A3       D0  011F              MOVL    CDT$L_FR5(R3),R5        ; Restore context from pending
          64 A3       DD  0123              PUSHL   CDT$L_FPC(R3)           ;  connx mgmt call
           FED7'      30  0126              BSBW    SCS$DEAL_ALLBUF         ; Clean up all receive buffers
     00000000'GF      16  0129              JSB     G^SCS$DEALL_CDT         ; Deallocate CDT (close status)
         50    2C     3C  012F              MOVZWL  #SS$_ABORT,R0           ; Set status to abort
               9E     16  0132              JSB     @(SP)+                  ; Restore pending call thread
         54    8E     7D  0134              MOVQ    (SP)+,R4                ; Restore R4, R5
         50    01     3C  0137              MOVZWL  #SS$_NORMAL,R0          ; Set DISCONNECT status to ok
                      05  013A              RSB                             ; Return from DISCONNECT
                          013B
                          013B  ;
                          013B  ; SYSAP has received an unsolicited DISCONNECT request from the
                          013B  ; remote SYSAP and now wishes to issue the matching DISCONNECT.
                          013B  .
                          013B
                          013B  DISC_DISC_REC:
                          013B
           FEC2'      30  013B              BSBW    SCS$MAP_VMSSTS          ; Convert reason from VMS to SCS
     26 A3     50     B0  013E              MOVW    R0,CDT$Q_REASON(R3)     ; Save DISCONNECT reason
               06     B0  0142              MOVW    #CDT$C_DISC_MTCH,-      ; Move CDT state to
          28 A3           0144                      CDT$W_STATE(R3)         ;  matching DISCONNECT sent
         50    04     3C  0146              MOVZWL  #CDT$C_DISC_PEND,R0     ; Set block state to send DISCONNECT
           FEB4'      30  0149  10$:        BSBW    SCS$REQ_SCSSEND         ; Send out the DISCONNECT
            0419      31  014C  20$:        BRW     SUSP_CONCALL            ; Suspend SYSAP till done
                          014F
                          014F  ;
                          014F  ; Connection is OPEN.  Force sending of any unextended credits (may
                          014F  ; send 0 credits).  Send out a DISCONNECT on the lowest priority queue.
                          014F  ; Move CDT state from OPEN to DISC_SENT.
                          014F  ;
                          014F
                          014F  DISC_OPEN:
                          014F
           FEAE'      30  014F              BSBW    SCS$MAP_VMSSTS          ; Convert status to SCS
     26 A3     50     B0  0152              MOVW    R0,CDT$Q_REASON(R3)     ; Save DISCONNECT reason
               05     B0  0156              MOVW    #CDT$C_DISC_SENT,-      ; Set CDT state to
          28 A3           0158                      CDT$W_STATE(R3)         ;  show DISCONNECT sent
         50    06     B0  015A              MOVW    #CDT$C_DCR_PEND,R0      ; Block state will be disconnect
                          015D                                              ;  + credit pending
               EA     11  015D              BRB     10$                     ; Request SCS send and suspend
                          015F                                              ;  SYSAP till DISCONNECT complete
                          015F
                          015F              .DSABL  LSB
                      015F         .SBTTL  SEQUENCED MESSAGE CALLS
                      015F         .SBTTL  -       FPC$ALLOCMSG,   ALLOCATE A MESSAGE BUFFER
                      015F
                      015F  ;+
                      015F  ; FPC$ALLOCMSG checks if there is at least one send credit.  If not, the
                      015F  ; SYSAP is suspended behind other waiting SYSAP's until there is.  The
                      015F  ; message buffer is allocated from nonpaged pool.  If insufficient pool
                      015F  ; is available, then the SYSAP is suspended until pool is available.
                      015F  ; The destination connection ID is then copied to the SCS header
                      015F  ; at this time so that the message can be sent harmlessly even if
                      015F  ; a power failure should occur.  (It will be discarded at the receiving
                      015F  ; end upon detection of connect ID sequence number mismatch.)  Finally,
                      015F  ; the address of the start of the application data within the buffer is
                      015F  ; computed and returned to the SYSAP.
                      015F  ;
                      015F  ; Inputs:
                      015F  ;
                      015F  ;      R4                       -Addr of PDT
                      015F  ;      R5                       -Addr of CDRP
                      015F  ;      CDRP$L_CDT               -Addr of CDT
                      015F  ;
                      015F  ; Outputs:
                      015F  ;
                      015F  ;      R0                       -Status:  SS$_NORMAL, SS$_ILLCDTST
                      015F  ;      R1                       -Destroyed
                      015F  ;      R2                       -Addr of message buffer, if status=success
                      015F  ;      Other registers          -Preserved
                      015F  ;
                      015F  ;      CDRP$L_MSG_BUF           -Addr of message buffer, if status=success
                      015F  ;-
                      015F
                      015F         .ENABL  LSB
                      015F
                      015F  FPC$ALLOCMSG::
                      015F
51    24 A5    D0     015F         MOVL    CDRP$L_CDT(R5),R1        ; Get CDT addr
                      0163         $CHK_CDTSTATE   -                ; Verify connection state
                      0163                 OPEN,-                   ;  is open.
                      0163                 ERROR=STATE_ERR,-        ; Else report error to SYSAP
                      0163                 CDT=R1                   ;
      18 A5 8ED0      016C         POPL    CDRP$L_SAVD_RTN(R5)      ; Save 1st level return
      40 A1    B5     0170         TSTW    CDT$W_SEND(R1)           ; Got any credit for send?
         1D    1A     0173         BGTRU   10$                      ; Branch if so
    0098 C1    B6     0175         INCW    CDT$W_QCR_CNT(R1)        ; Step count of # credit waits
                      0179         $SUSP_SCS       -                ; Else suspend SCS routine
                      0179                 @CDT$L_CRWAITQBL(R1)     ;  on credit wait queue
                      0192
       FE6B'   30     0192  10$:   BSBW    INT$ALLOC_MSG            ; Allocate a message buffer
      1C 50    E8     0195         BLBS    R0,20$                   ; Branch if got it
                      0198         $SUSP_SCS       -                ; Else suspend this routine
                      0198                 @PDT$L_WAITQBL(R4)       ;  on pool wait queue
         DE    11     01B2         BRB     10$                      ; Try to allocate now
                      01B4
51    24 A5    D0     01B4  20$:   MOVL    CDRP$L_CDT(R5),R1        ; Get CDT addr again
      14 A1    D0     01B8         MOVL    CDT$L_RCONID(R1),-       ; Set destination connect
      F8 A2           01BB                 SCS$L_DST_CONID(R2)      ;  ID in SCS header
1C A5    52    D0     01BD         MOVL    R2,CDRP$L_MSG_BUF(R5)    ;  data and save in CDRP
```

```
                         4C   11  01C1    665          BRB      50$                     ; Join common exit code
```

```
                 01C3           .SBTTL  -       FPC$RCHMSGBUF,  RECYCLE MESSAGE BUFFER
                 01C3           .SBTTL  -                       AT HIGH PRIORITY
                 01C3           .SBTTL  -       FPC$RCLMSGBUF,  RECYCLE MESSAGE BUFFER
                 01C3           .SBTTL  -                       AT LOW PRIORITY
                 01C3
                 01C3   ;+
                 01C3   ; FPC$RCxMSGBUF checks if there is at least one send credit.  If
                 01C3   ; not, the SYSAP is suspended until there is.  FPC$RCxMSGBUF then
                 01C3   ; decrements the send credit.  The wait, if required, places the
                 01C3   ; SYSAP CDRP at the end of the wait queue for low priority and at
                 01C3   ; the head of the queue for high priority.  The address of the
                 01C3   ; buffer being recycled is returned in both R2 and CDRP$L_MSG_BUF.
                 01C3   ; The remote connection ID s set in the SCS header so that the
                 01C3   ; message can be sent harmlessly even if a power failure should occur.
                 01C3   ; (It will be discarded by the receiving SCS.)
                 01C3   ;
                 01C3   ; Inputs:
                 01C3   ;
                 01C3   ;       R4                      -Addr of PDT
                 01C3   ;       R5                      -Addr of CDRP
                 01C3   ;       CDRP$L_CDT              -Addr of CDT
                 01C3   ;       CDRP$L_MSG_BUF          -Addr of msg buffer
                 01C3   ;
                 01C3   ; Outputs:
                 01C3   ;
                 01C3   ;       R0                      -Status:  SS$_NORMAL, SS$_ILLCDTST
                 01C3   ;       R2                      -Addr of message buffer
                 01C3   ;       R1                      -Destroyed
                 01C3   ;       Other registers         -Preserved
                 01C3   ;       CDRP$L_MSG_BUF(R5)      -Addr of message buffer
                 01C3   ;-
                 01C3
                 01C3
                 01C3   FPC$RCHMSGBUF::
                 01C3
51    24 A5   D0 01C3           MOVL    CDRP$L_CDT(R5),R1       ; Get CDT addr
50    38 A1   DE 01C7           MOVAL   CDT$L_CRWAITQFL(R1),R0  ; Get addr of head of wait queue
         08   11 01CB           BRB     30$                     ; Join common processing
                 01CD
                 01CD   FPC$RCLMSGBUF::
                 01CD
51    24 A5   D0 01CD           MOVL    CDRP$L_CDT(R5),R1       ; Get CDT addr
50    3C A1   D0 01D1           MOVL    CDT$L_CRWAITQBL(R1),R0  ; Get addr of end of wait queue
                 01D5
                 01D5   30$:    $CHK_CDTSTATE   -               ; Verify connection state
                                        OPEN,-                  ;  is open
                 01D5                   ERROR=STATE_ERR,-               ; Else report error to SYSAP
                 01D5                   CDT=R1                  ;
      18 A5 8ED0 01DE           POPL    CDRP$L_SAVD_RTN(R5)     ; Copy return to SYSAP from stack
                 01E2                                           ;  to CDRP
      40 A1   B5 01E2           TSTW    CDT$W_SEND(R1)          ; Got a send credit?
         1F   1A 01E5           BGTRU   40$                     ; Branch if so
   51    50   D0 01E7           MOVL    R0,R1                   ; Get queue hdr in less volatile
                 01EA                                           ;  register
                 01EA           $SUSP_SCS (R1)                  ; Else suspend this routine
51    24 A5   D0 0202           MOVL    CDRP$L_CDT(R5),R1       ; Retreive CDT addr
                 0206
```

```
52    1C A5    D0  0206    724 40$:    MOVL    CDRP$L_MSG_BUF(R5),R2   ; Get msg addr in register
      14 A1    D0  020A    725         MOVL    CDT$L_RCONID(R1),-      ; Set remote CONID in SCS header
      F8 A2        020D    726                 SCS$L_DST_CONID(R2)
      40 A1    B7  020F    727 50$:    DECW    CDT$W_SEND(R1)          ; Mark one credit used
   50    01    3C  0212    728         MOVZWL  #SS$_NORMAL,R0          ; Set status to success
      18 B5    17  0215    729         JMP     @CDRP$L_SAVD_RTN(R5)    ; Return to SYSAP
                   0218    730
                   0218    731         .DSABL  LSB
```

```
                      0218            .SBTTL  -       FPC$DEALLOMSG,  DEALLOCATE A MESSAGE BUFFER
                      0218            .SBTTL  -       FPC$DEALRGMSG,  DEALLOCATE A MESSAGE BUFFER,
                      0218            .SBTTL  -                       ARGUMENTS PASSED IN REGISTERS
                      0218
                      0218     ;+
                      0218     ; FPC$DEALLOMSG resets the message address specified by the caller to
                      0218     ; the top of the message buffer and compares the current number of
                      0218     ; receive message buffers with the initial count specified at the
                      0218     ; time of the connect.  If the current receive count is not less than
                      0218     ; the initial, then the message buffer is deallocated to nonpaged
                      0218     ; pool.  If the current receive count is less than the initial,
                      0218     ; then the buffer is added to the free message queue and the pending
                      0218     ; receive count is incremented.  If the receive count was also less
                      0218     ; than the minimum required by the remote SYSAP plus the flow control
                      0218     ; cushion (SCS$GW_FLOWCUSH), then the CDT is queued for sending a
                      0218     ; CREDIT message to the remote.
                      0218     ;
                      0218     ; Entry FPC$DEALRGMSG is called with the same arguments as DEALLOMSG,
                      0218     ; but in registers instead of the CDRP.
                      0218     ;
                      0218     ; Inputs:
                      0218     ;
                      0218     ;       R2                      -Addr of message buffer (FPC$DEALRGMSG)
                      0218     ;       R3                      -Addr of CDT (FPC$DEALRGMSG)
                      0218     ;       R4                      -Addr of PDT
                      0218     ;       R5                      -Addr of CDRP
                      0218     ;       CDRP$L_CDT              -Addr of CDT (FPC$DEALLOMSG)
                      0218     ;       CDRP$L_MSG_BUF          -Addr of msg buffer (FPC$DEALLOMSG)
                      0218     ;
                      0218     ; Outputs:
                      0218     ;
                      0218     ;       R0-R2                   -Destroyed
                      0218     ;       Other registers         -Preserved
                      0218     ;       CDRP$L_MSG_BUF(R5)      -0 (FPC$DEALLOMSG only)
                      0218     ;-
                      0218
                      0218            .ENABL  LSB
                      0218
                      0218    FPC$DEALLOMSG::
                      0218
          53      DD  0218            PUSHL   R3                      ; Save caller's R3
 52    1C A5      D0  021A            MOVL    CDRP$L_MSG_BUF(R5),R2   ; Get addr of message buffer
 53    24 A5      D0  021E            MOVL    CDRP$L_CDT(R5),R3       ; Get addr of CDT
          07      10  0222            BSBB    FPC$DEALRGMSG           ; Call routine to deallocate
          53    8ED0  0224            POPL    R3                      ; Restore caller's R3
       1C A5      D4  0227            CLRL    CDRP$L_MSG_BUF(R5)      ; Zero msg addr in CDRP
                  05  022A            RSB                             ; Return
                      022B
                      022B    FPC$DEALRGMSG::                         ; Entry for appl data pointer in R2
                      022B                                            ;  and CDT addr in R3
       42 A3      A1  022B            ADDW3   CDT$W_REC(R3),-         ; Compute total receive credits now
 50    46 A3          022E                    CDT$W_PENDREC(R3),R0    ;  = extended + not yet extended
 48 A3    50      B1  0231            CMPW    R0,CDT$W_INITLREC(R3)   ; Total receive less than initial?
          06      1F  0235            BLSSU   10$                     ; Branch if so
       FDC6'      30  0237            BSBW    INT$DEAL_MSG            ; Deallocate message buffer
                      023A                                            ;  to nonpaged pool
          52      D4  023A            CLRL    R2                      ;***Debug code
```

```
                   05  023C   790         RSB                                   ; Return to SYSAP
                       023D   791
           FDC0'   30  023D   792 10$:    BSBW    INT$INS_MFREEQ                ; Insert buffer on free queue
           46 A3   B6  0240   793         INCW    CDT$W_PENDREC(R3)             ; Reflect insert in credit
     00000000'GF   A1  0243   794         ADDW3   G^SCS$GW_FLOWCUSH,-           ; Compute cushion + minimum #
     50    44 A3       0249   795                 CDT$W_MINREC(R3),R0           ;  send credits req'd by remote
     50    42 A3   B1  024C   796         CMPW    CDT$W_REC(R3),R0              ; Is current # recv buffers less
                       0250   797                                               ;  cushion + minimum?
              13   1A  0250   798         BGTRU   30$                           ; Branch if not
        50    05   3C  0252   799         MOVZWL  #CDT$C_CR_PEND,R0             ; Get credit block state code
                       0255   800         $DISPATCH -                           ;
                       0255   801                 CDT$W_STATE(R3),-             ; If connection is in any of the
                       0255   802                 <-                            ;  states that indicate
                       0255   803                 <CDT$C_DISC_ACK,30$>,-        ;  that the local SYSAP has
                       0255   804                 <CDT$C_DISC_SENT,30$>,-       ;  issued a DISCONNECT request,
                       0255   805                 <CDT$C_DISC_MTCH,30$>,-       ;  then don't ask to send a credit
                       0255   806                 >                             ;  request -- if we are already
                       0262   807                                               ;  queued to send the final credit
                       0262   808                                               ;  that preceeds the DISCONNECT, then
                       0262   809                                               ;  the latest credit will be included,
                       0262   810                                               ;  otherwise it won't
                       0262   811
           FD9B'   30  0262   812 20$:    BSBW    SCS$REQ_SCSSEND               ; Request xmit of credit message
                       0265   813
                   05  0265   814 30$:    RSB                                   ; Return to SYSAP
                       0266   815
                       0266   816         .DSABL  LSB
```

```
                              0266          .SBTTL  -       FPC$SENDMSG,    SEND A SEQUENCED MESSAGE
                              0266
                              0266     ;+
                              0266     ; The SCS header of the specified message buffer is filled in.
                              0266     ; If the response ID is 0, then the message is queued for transmission
                              0266     ; with RETFLAG = 1(TRUE) thus channeling the sent buffer to the response
                              0266     ; queue for reclaim.  If the response ID is non-zero, then a
                              0266     ; responsed is expected from the remote SYSAP and the messag is sent
                              0266     ; with RETFLAG = 0(FALSE).  RETFLAG = FALSE channels the sent buffer to
                              0266     ; the message free queue in anticipation of the response.  In this
                              0266     ; case the receive credit is also incremented to account for the
                              0266     ; buffer being added to the free queue.  All messages are sent
                              0266     ; on the high priority queue.
                              0266     ;
                              0266     ; Inputs:
                              0266     ;
                              0266     ;       R1                              -# bytes application data (FPC$SENDCNTMSG)
                              0266     ;       R4                              -Addr of PDT
                              0266     ;       R5                              -Addr of CDRP
                              0266     ;       CDRP$L_CDT(R5)                  -Addr of CDT
                              0266     ;       CDRP$L_MSG_BUF(R5)              -Addr of message
                              0266     ;       CDRP$L_RSPID(R5)                -RSPID (to set RETFLG)
                              0266     ;
                              0266     ; Outputs:
                              0266     ;
                              0266     ;       R0                              -Status:  SS$_NORMAL, SS$_ILLCDTST
                              0266     ;       R1,R2                           -Destroyed
                              0266     ;       Other registers                 -Preserved
                              0266     ;
                              0266     ;       CDRP$L_MSG_BUF(R5)              -Zeroed to show msg buffer gone
                              0266     ;-
                              0266
                              0266          .ENABL  LSB
                              0266
                              0266     FPC$SENDMSG::
                              0266
51   00000000'GF          3C  0266          MOVZWL  G^SCS$GW_MAXMSG,R1          ; Set for default
                              026D
                              026D     FPC$SNDCNTMSG::
                              026D
                 53       DD  026D          PUSHL   R3                          ; Save caller's R3
         53   24 A5       D0  026F          MOVL    CDRP$L_CDT(R5),R3           ; Get CDT addr in R3
                              0273          $CHK_CDTSTATE   -                   ; Verify connection is
                              0273                  OPEN,-                      ;  open
                              0273                  ERROR=STATE_ERR_R3,-        ; Else report error to SYSAP
                              0273                  CDT=R3                      ;
                 50       D4  027C          CLRL    R0                          ; Assume RETFLAG will be false
                              027E                                              ;  and we will put msg on free queue
              20 A5       D5  027E          TSTL    CDRP$L_RSPID(R5)            ; Is there a rspid?
                 11       12  0281          BNEQ    10$                         ; Branch if there is
              42 A3       A1  0283          ADDW3   CDT$W_REC(R3),-             ; Else compute total receive credits
         52   46 A3           0286                  CDT$W_PENDREC(R3),R2        ;  queued now
      48 A3      52       B1  0289          CMPW    R2,CDT$W_INITLREC(R3)       ; Current recv less than initial?
                 05       1F  028D          BLSSU   10$                         ; Branch if so
          50     01       D0  028F          MOVL    #SYSAP$C_DISPRET,R0         ; Else set RETFLAG true
                 03       11  0292          BRB     20$                         ; Join common processing
                              0294
```

```
             46 A3     B6 0294  10$:    INCW    CDT$W_PENDREC(R3)        ; Step pending receive to reflect
                          0297                                            ;  msg port will put on free queue
                          0297
                          0297
        52    1C A5    D0 0297  20$:    MOVL    CDRP$L_MSG_BUF(R5),R2    ; Get message buffer addr
 F0 A2   51    0E      A1 029B          ADDW3   #SCS$C_CVHD,R1,-         ; Set SCS length
                          02A0                  SCS$W_LENGTH(R2)         ;
                 0A    B0 02A0          MOVW    #SCS$C_APPL_MSG,-        ; Set SCS type to application
              F4 A2       02A2                  SCS$W_MTYPE(R2)          ;  message
              46 A3    B0 02A4          MOVW    CDT$W_PENDREC(R3),-      ; Extend any pending receive
              F6 A2       02A7                  SCS$W_CREDIT(R2)         ;  credits to the remote
              46 A3    A0 02A9          ADDW    CDT$W_PENDREC(R3),-      ; Move pending receives to
              42 A3       02AC                  CDT$W_REC(R3)            ;  actual receives (real send
                          02AE                                            ;  credits extended)
              46 A3    B4 02AE          CLRW    CDT$W_PENDREC(R3)        ; No more pending credit
              18 A3    D0 02B1          MOVL    CDT$L_LCONID(R3),-       ; Put local connection ID
              FC A2       02B4                  SCS$L_SRC_CONID(R2)      ;  into header
        51    1C A3    D0 02B6          MOVL    CDT$L_PB(R3),R1          ; Get address of PB in R1
              7C A3    D6 02BA          INCL    CDT$L_MSGSENT(R3)        ; Step count of msgs sent
              FD40'    30 02BD          BSBW    INT$SNDMSG               ; Send the message with RETFLAG in R0
                 53  8ED0 02C0          POPL    R3                       ; Restore SYSAP's R3
              1C A5    D4 02C3          CLRL    CDRP$L_MSG_BUF(R5)       ; Mark msg as no longer held by CDRP
              20 A5    D5 02C6          TSTL    CDRP$L_RSPID(R5)         ; Was RETFLAG true?
                 13    13 02C9          BEQL    FPC_SUCCESS              ; Branch if yes
                          02CB          $SUSP_FP                         ; Save fork process' context
                          02D4
                          02D4          .DSABL  LSB
```

```
                         02D4            .SBTTL  DATAGRAM SERVICE CALLS
                         02D4            .SBTTL  -       FPC$ALLOCDG,    ALLOCATE A DATAGRAM BUFFER
                         02D4
                         02D4    ;+
                         02D4    ; FPC$ALLOCDG allocates one datagram buffer from nonpaged pool.  If
                         02D4    ; none is available, error status is returned to the caller.  Otherwise,
                         02D4    ; the address of space for application data within the buffer
                         02D4    ; is computed and returned to the caller.
                         02D4    ;
                         02D4    ; Inputs:
                         02D4    ;
                         02D4    ;       R4                              -Addr of PDT
                         02D4    ;       R5                              -Addr of CDRP
                         02D4    ;
                         02D4    ; Outputs:
                         02D4    ;
                         02D4    ;       R0                              -Status:  SS$_NORMAL, SS$_INSFMEM
                         02D4    ;       R2                              -Addr of dg, start of application data
                         02D4    ;       CDRP$L_MSG_BUF                  -Copy of R2
                         02D4    ;       Other registers                 -Preserved
                         02D4    ;-
                         02D4
                         02D4            .ENABL  LSB
                         02D4
                         02D4    FPC$ALLOCDG::
                         02D4
          FD29'    30    02D4            BSBW    INT$ALLOC_DG            ; Allocate 1 dg buffer from pool
          08 50    E9    02D7            BLBC    R0,DG_ALC_FAIL          ; Branch if failed
   1C A5     52    D0    02DA            MOVL    R2,CDRP$L_MSG_BUF(R5)   ; Save addr in CDRP
                         02DE
                         02DE    FPC_SUCCESS:
                         02DE
      50     01    3C    02DE            MOVZWL  #SS$_NORMAL,R0          ; Set status to success
                   05    02E1            RSB                             ; Return
                         02E2
                         02E2    DG_ALC_FAIL:
                         02E2
 50    0124 8F     3C    02E2            MOVZWL  #SS$_INSFMEM,R0         ; Set status to failure
                   05    02E7            RSB                             ; Return
                         02E8
                         02E8            .DSABL  LSB
```

```
                02E8          .SBTTL  -       FPC$DEALLOCDG,  DEALLOCATE A DATAGRAM BUFFER
                02E8          .SBTTL  -                       TO NONPAGED POOL
                02E8
                02E8    ;+
                02E8    ; FPC$DEALLOCDG simply converts the datagram aaddress to the address
                02E8    ; of the start of the buffer containing the datagram and calls
                02E8    ; COM$DRVDEALMEM.
                02E8    ;
                02E8    ; Inputs:
                02E8    ;
                02E8    ;       R2                      -Addr of datagram
                02E8    ;       R4                      -Addr of PDT
                02E8    ;
                02E8    ; Outputs:
                02E8    ;
                02E8    ;       R0                      -Destroyed
                02E8    ;       R2                      -0
                02E8    ;       Other registers         -Preserved
                02E8    ;-
                02E8
                02E8          .ENABL  LSB
                02E8
                02E8    FPC$DEALLOCDG::
                02E8
  FD15'   30    02E8          BSBW    INT$DEAL_DG             ; Deallocate buffer
     52   D4    02EB          CLRL    R2                      ; Mark dg addr as gone
          05    02ED          RSB                             ; Return to SYSAP
                02EE
                02EE          .DSABL  LSB
```

```
                 02EE         .SBTTL  -      FPC$QUEUEDG,    QUEUE A SYSAP SUPPLIED BUFFER
                 02EE         .SBTTL  -                      TO THE DATAGRAM FREE QUEUE
                 02EE
                 02EE  ;+
                 02EE  ; FPC$QUEUE allows a SYSAP to supply the port with a buffer to insert
                 02EE  ; on the datagram free queue.  The SYSAP must correctly set the type
                 02EE  ; and size field before calling this routine.  The datagram receive
                 02EE  ; count in the SYSAP's CDT is incremented.
                 02EE  ;
                 02EE  ; INPUTS:
                 02EE  ;
                 02EE  ;      R2                      -Addr of start of buffer (NOT appl data)
                 02EE  ;      R3                      -Addr of CDT
                 02EE  ;      R4                      -Addr of PDT
                 02EE  ;      CDT$W_DGREC(R3)         -Current DG receive count
                 02EE  ;
                 02EE  ; OUTPUTS:
                 02EE  ;
                 02EE  ;      R0                      -Status:  SS$_NORMAL
                 02EE  ;      R1                      -Preserved
                 02EE  ;      R2                      -Zeroed
                 02EE  ;      CDT$W_DGREC(R3)         -Incremented
                 02EE  ;-
                 02EE
                 02EE FPC$QUEUEDG::
                 02EE
   FDOF'   30    02EE         BSBW    INT$INS_DFREEQX         ; Insert buffer on port queue
  4C A3    B6    02F1         INCW    CDT$W_DGREC(R3)         ; Step SYSAP's receive count
     20    11    02F4         BRB     Q_SUCCESS               ; Finish up
```

```
                02F6        .SBTTL  -       FPC$QUEUEMDGS,  ALLOCATE DG'S AND QUEUE FOR
                02F6        .SBTTL  -                       RECEIVES OR
                02F6        .SBTTL  -                       DEQUEUE DG'S AND RETURN TO
                02F6        .SBTTL  -                       NONPAGED POOL
                02F6
                02F6  ;+
                02F6  ; FPC$QUEUEMDGS is used by SYSAP's to alter the number of datagram buffers
                02F6  ; they have queued for receives.  The datagram count is positive if
                02F6  ; datagrams are to be allocated from pool and queued for receives.  The
                02F6  ; count agrument is negative if datagrams are to be removed from the queue
                02F6  ; and returned to nonpaged pool.
                02F6  ;
                02F6  ; If datagrams are being added, then for each one allocated and queued,
                02F6  ; the datagram receive count in the SYSAP's CDT is incremented.  If there
                02F6  ; is insufficient pool for all to be allocated, then the number actually
                02F6  ; queued is returned to the SYSAP with a warning status.
                02F6  ;
                02F6  ; If datagrams are being withdrawn from the queue, then for each
                02F6  ; one dequeued and returned to pool, the datagram receive count in the
                02F6  ; SYSAP's CDT is decremented. If the datagram receive count reaches
                02F6  ; 0 before all that the SYSAP requested have been dequeued, then the
                02F6  ; number actually dequeued is returned to the caller with warning
                02F6  ; status.
                02F6  ;
                02F6  ; Inputs:
                02F6  ;
                02F6  ;       R1                      -# of dg's to add (+) or
                02F6  ;                                to withdraw (-)
                02F6  ;       R3                      -Addr of CDT
                02F6  ;       R4                      -Addr of PDT
                02F6  ;       CDT$W_DGREC(R3)         -Current dg receive count
                02F6  ;
                02F6  ; Outputs:
                02F6  ;
                02F6  ;       R0                      -Status:  SS$_NORMAL, SS$_DGQINCOMP
                02F6  ;                                (Datagram queuing incomplete)
                02F6  ;       R1                      -# actually added (+) or withdrawn (-)
                02F6  ;       R2                      -Destroyed
                02F6  ;       Other registers         -Preserved
                02F6  ;       CDT$W_DGREC(R3)         -Updated
                02F6  ;-
                02F6
                02F6        .ENABL  LSB
                02F6
                02F6  FPC$QUEUEMDGS::
                02F6
       7E    D4 02F6        CLRL    -(SP)                   ; Set running dg count = 0
       51    D5 02F8        TSTL    R1                      ; Check dg count requested
       1A    13 02FA        BEQL    Q_SUCCESS               ; Branch if nothing to do
       1C    19 02FC        BLSS    DQUEUE_DG               ; Branch if withdrawing
                02FE
                02FE  QUEUE_DG:
                02FE
       51    DD 02FE        PUSHL   R1                      ; Save count argument
    FCFD'    30 0300        BSBW    INT$ALLOC_DG            ; Allocate a dg buffer
       51  8ED0 0303        POPL    R1                      ; Restore argument
    2D 50    E9 0306        BLBC    R0,Q_INCOMPLETE         ; Branch if allocate failed
```

```
             FCF4'  30  0309  1062           BSBW    INT$INS_DFREEQ           ; Else insert buffer on port queue
           4C A3    B6  030C  1063           INCW    CDT$W_DGREC(R3)          ; Step SYSAP's receive count
     EB 6E    51    F2  030F  1064           AOBLSS  R1,(SP),QUEUE_DG         ; Step running tally and branch
                          0313  1065                                          ;  if less than requested
              51 8ED0   0313  1066           POPL    R1                       ; Retreive total tally from stack
                          0316  1067
                          0316  1068 Q_SUCCESS:
                          0316  1069
         50    01    3C  0316  1070           MOVZWL  #SS$_NORMAL,R0           ; Set status to success
                     05  0319  1071           RSB                              ; Return to SYSAP
                          031A  1072
                          031A  1073 DQUEUE_DG:
                          031A  1074
         51    51    CE  031A  1075           MNEGL   R1,R1                    ; Trun request count positive
                          031D  1076
           4C A3    B5  031D  1077 20$:      TSTW    CDT$W_DGREC(R3)          ; SYSAP have more dg's queued?
              11    15  0320  1078           BLEQ    DQ_INCOMPLETE            ; Branch if not
             FCDB'  30  0322  1079           BSBW    INT$DFQ2POOL             ; Remove a dg from free queue
              0F    1D  0325  1080           BVS     Q_INCOMPLETE             ; Branch if none
           4C A3    B7  0327  1081           DECW    CDT$W_DGREC(R3)          ; Decrement SYSAP's recv count
     EF 6E    51    F2  032A  1082           AOBLSS  R1,(SP),20$              ; Step running tally, branch
                          032E  1083                                          ;  if more to do
         51    8E    CE  032E  1084           MNEGL   (SP)+,R1                 ; Retreive total tally and negate
               E3    11  0331  1085           BRB     Q_SUCCESS                ; Join common success exit
                          0333  1086
                          0333  1087 DQ_INCOMPLETE:
                          0333  1088
         6E    6E    CE  0333  1089           MNEGL   (SP),(SP)                ; Turn tally into negative #
                          0336  1090
                          0336  1091 Q_INCOMPLETE:
                          0336  1092
              51 8ED0   0336  1093           POPL    R1                       ; Retreive tally from stack
  50    09C0 8F     3C  0339  1094           MOVZWL  #SS$_DGQINCOMP,R0        ; Set status to error
                     05  033E  1095           RSB                              ; Return
                          033F  1096
                          033F  1097           .DSABL  LSB
```

```
                    033F         .SBTTL  -       FPC$SENDDG,     SEND DATAGRAM
                    033F         .SBTTL  -       FPC$SENDRGDG,   SEND DG, NO CDRP
                    033F
                    033F   ;+
                    033F   ; FPC$SENDDG formats and sends the caller-specified datagram.  The
                    033F   ; SYSAP can specify via the flags input argument what happens to the
                    033F   ; buffer once it has been sent:
                    033F   ;
                    033F   ;       flags   = SYSAP$C_DISPQ implies that the buffer is placed
                    033F   ;                 on the datagram free queue for a future receive.
                    033F   ;                 The SYSAP's datagram receive count is incremented
                    033F   ;                 in the CDT in anticipation of the buffer going on
                    033F   ;                 the free queue.
                    033F   ;
                    033F   ;               = SYSAP$C_DISPRET says that the SYSAP wants the sent
                    033F   ;                 buffer back, so RETFLAG is set to 1 (true) and
                    033F   ;                 DISPOSAL is 1.
                    033F   ;
                    033F   ;               = SYSAP$C_DISPPO says that the SYSAP wants SCS to
                    033F   ;                 put the sent buffer in nonpaged pool, so RETFLAG
                    033F   ;                 is set to 1 (true) and DISPOSAL = 0.
                    033F   ;
                    033F   ; This data is all expressed in table DG_SENT_FLGS.
                    033F   ;
                    033F   ; Inputs:
                    033F   ;
                    033F   ;       R0                              -Input flag described above
                    033F   ;       R1                              -Length of application data in dg
                    033F   ;       R2                              -Addr of dg, application data (FPC$SENDRGDG)
                    033F   ;       R3                              -Addr of CDT (FPC$SENDRGDG)
                    033F   ;       R4                              -Addr of PDT
                    033F   ;       R5                              -Addr of CDRP (FPC$SENDDG)
                    033F   ;       CDRP$L_CDT                      -Addr of CDT (FPC$SENDDG)
                    033F   ;       CDRP$L_MSG_BUF                  -Addr of datagram
                    033F   ;
                    033F   ; Outputs:
                    033F   ;
                    033F   ;       R0                              -Status:  SS$_NORMAL, SS$_ILLCDTST
                    033F   ;       R2                              -Destroyed
                    033F   ;       Other registers                 -Preserved
                    033F   ;-
                    033F
                    033F         .ENABL  LSB
                    033F
                    033F   FPC$SENDRGDG::
                    033F
          53   DD   033F         PUSHL   R3                      ; Save caller's R3
                    0341         $CHK_CDTSTATE   -               ; Verify that connection state
                    0341                 OPEN,-                  ;  is open
                    0341                 ERROR=STATE_ERR_R3,-    ;
                    0341                 CDT=R3                  ;
          16   11   034A         BRB     10$                     ; Join common code
                    034C
                    034C   FPC$SENDDG::
                    034C
          53   DD   034C         PUSHL   R3                      ; Save caller's R3
   53  24 A5   D0   034E         MOVL    CDRP$L_CDT(R5),R3       ; Get addr of CDT
```

```
                          0352  1156          $CHK_CDTSTATE    -              ; Verify that connection state
                          0352  1157                  OPEN,-                  ;  is open
                          0352  1158                  ERROR=STATE_ERR_R3,-    ; Else report error to SYSAP
                          0352  1159                  CDT=R3                  ;
           52   1C A5  D0 0358  1160          MOVL    CDRP$L_MSG_BUF(R5),R2   ; Get addr of dg buff, appl data
                1C A5  D4 035F  1161          CLRL    CDRP$L_MSG_BUF(R5)      ; Show dg is gone
                          0362  1162
                   50  95 0362  1163 10$:     TSTB    R0                      ; Dg going on to free queue?
                   03  12 0364  1164          BNEQ    20$                     ; Branch if not
                4C A3  B6 0366  1165          INCW    CDT$W_DGREC(R3)         ; Else step recv count in anticipation
                          0369  1166
  F0 A2    51      0E  A1 0369  1167 20$:     ADDW3   #SCS$C_OVHD,R1,-        ; Dg length = SCS header size +
                          036E  1168                  SCS$W_LENGTH(R2)        ;   application data
                   0B  3C 036E  1169          MOVZWL  #SCS$C_APPL_DG,-        ; Set SCS type to application
                F4 A2     0370  1170                  SCS$W_MTYPE(R2)         ;  datagram
                14 A3  D0 0372  1171          MOVL    CDT$L_RCONID(R3),-      ; Set destination connection
                F8 A2     0375  1172                  SCS$L_DST_CONID(R2)     ;  ID in SCS header
                18 A3  D0 0377  1173          MOVL    CDT$L_LCONID(R3),-      ; Put local connection ID
                FC A2     037A  1174                  SCS$L_SRC_CONID(R2)     ;  into header
           51   1C A3  D0 037C  1175          MOVL    CDT$L_PB(R3),R1         ; Get address of PB in R1
                70 A3  D6 0380  1176          INCL    CDT$L_DGSENT(R3)        ; Step count of application dgs sent
                 FC7A'  30 0383  1177         BSBW    INT$SNDDG               ; Send datagram
                   53 8ED0 0386  1178         POPL    R3                      ; Restore caller's R3
              50   01  3C 0389  1179          MOVZWL  #SS$_NORMAL,R0          ; Set status to success
                       05 038C  1180          RSB                             ; Return to SYSAP
                          038D  1181
                          038D  1182          .DSABL  LSB
```

```
038D          .SBTTL  BLOCK TRANSFER CALLS
038D          .SBTTL  -       FPC$MAP,          MAP A BUFFER
038D          .SBTTL  -       FPC$MAPBYPASS,    MAP A BUFFER W/
038D          .SBTTL  -                         NO ACCESS CHECKING
038D          .SBTTL  -       FPC$MAPIRP,       MAP A BUFFER W/
038D          .SBTTL  -                         ARGUMENTS IN IRP
038D          .SBTTL  -       FPC$MAPIRPBYP,    MAP A BUFFER W/
038D          .SBTTL  -                         ARGUMENTS IN IRP AND NO
038D          .SBTTL  -                         ACCESS CHECKING
038D
038D    ;+
038D    ; Each of the entries converts its inputs to a set of common inputs:
038D    ;
038D    ;       R1                      -Addr of 3 longwd array containing
038D    ;                                SVAPTE, BOFF, and BCNT (size) of
038D    ;                                buffer to map.
038D    ;       R2                      -Buffer descriptor flags consisting of
038D    ;                                valid (bit 15), access mode = 0/1/2/3
038D    ;                                (bits 13,14), and access checking = 0/1
038D    ;                                for disabled/enabled (bit 12).
038D    ;
038D    ; Common map processing then consists of allocating a buffer descriptor
038D    ; from the pool (common to all CI ports), filling in the buffer descriptor
038D    ; and then filling in the SYSAP's buffer handle.
038D    ;
038D    ; If no buffer descriptor is available, then the common inputs are
038D    ; saved temporarily in the buffer handle provided by the SYSAP.  The
038D    ; SCS MAP routine is suspended until resumed by the deallocation of a buffer
038D    ; descriptor.  Upon resumption, all context is retreived including R1
038D    ; and R2 and a buffer descriptor allocated.
038D    ;
038D    ; Inputs to all MAP calls:
038D    ;
038D    ;       R4                      -PDT addr
038D    ;       R5                      -CDRP addr
038D    ;
038D    ;       CDRP$L_CDT              -Addr of CDT
038D    ;       CDRP$L_LBUFH_AD         -Addr of SYSAP's buffer handle
038D    ;
038D    ;       CDT$L_RCONID            -Remote connection ID
038D    ;
038D    ; Inputs to MAP, MAPBYPASS:
038D    ;
038D    ;       R1                      -Addr of SVAPTE/BOFF/BCNT array
038D    ;       R2                      -Access mode = 0/1/2/3 for kernel/
038D    ;                                exec/super/user
038D    ;
038D    ; Inputs to MAPIRP, MAPIRPBYP:
038D    ;
038D    ;       CDRP$L_SVAPTE(R5)       = Addr of SVAPTE in IRP
038D    ;       CDRP$B_RMOD(R5)         = Addr of access mode
038D    ;
038D    ; Outputs for all map routines:
038D    ;
038D    ;       @CDRP$L_LBUFH_AD(R5)    -Filled in with byte offset of buffer,
038D    ;                                buffer name, local connection ID
038D    ;-
```

```
                               038D
                               038D          .ENABL  LSB
                               038D
                               038D FPC$MAPIRPBYP::
                               038D
         51    CC A5    DE     038D          MOVAL   CDRP$L_SVAPTE(R5),R1    ; Get addr in IRP of SVAPTE
         52    AB A5    9A     0391          MOVZBL  CDRP$B_RMOD(R5),R2      ;  and access mode
                               0395
                               0395 FPC$MAPBYPASS::
                               0395
                               0395          ASSUME  CIBD$V_V EQ 15
                               0395
            52    04    A8     0395          BISW    #4,R2                   ; Set valid bit to left of access mode
      52    52    0D    78     0398          ASHL    #CIBD$V_ACMOD,R2,R2     ; Position valid, access mode
                  19    11     039C          BRB     MAP_COMMON              ; Join common code
                               039E
                               039E FPC$MAPIRP::
                               039E
          0044 8F       B3     039E          BITW    #<IRP$M_PAGIO!IRP$M_SWAPIO>,-
             CA A5             03A2                  CDRP$W_STS(R5)          ; Is this page/swap I/O?
                  E7    12     03A4          BNEQ    FPC$MAPIRPBYP           ; Branch if so to bypass
         51    CC A5    DE     03A6          MOVAL   CDRP$L_SVAPTE(R5),R1    ; Get addr in IRP of SVAPTE
         52    AB A5    9A     03AA          MOVZBL  CDRP$B_RMOD(R5),R2      ;  and access mode
                               03AE
                               03AE FPC$MAP::
                               03AE
      52    52    0D    78     03AE          ASHL    #CIBD$V_ACMOD,R2,R2     ; Position access mode
      52    9000 8F     A8     03B2          BISW    #CIBD$M_V!CIBD$M_AC,R2  ; Set valid and access check
                               03B7
                               03B7 MAP_COMMON:
                               03B7
            18 A5 8ED0         03B7          POPL    CDRP$L_SAVD_RTN(R5)     ; Pop return from stack to CDRP
                               03BB
                               03BB ALLOC_BD:
                               03BB
                  53    DD     03BB          PUSHL   R3                      ; Save SYSAP register
   50     00000000'GF   D0     03BD          MOVL    G^SCS$GL_BDT,R0         ; Get addr of buffer desc table
         53    F4 A0    D0     03C4          MOVL    CIBDT$L_FREEBD(R0),R3   ; Get addr of 1st free desc
                  44    13     03C8          BEQL    WAIT_BD                 ; Branch if none
            0C A3       D0     03CA          MOVL    CIBD$L_LINK(R3),-       ; Remove BD from linked
            F4 A0              03CD                  CIBDT$L_FREEBD(R0)      ;  List
                               03CF
                               03CF          ASSUME  CDRP$L_SVAPTE+4 EQ CDRP$W_BOFF
                               03CF          ASSUME  CDRP$W_BOFF+2   EQ CDRP$L_BCNT
                               03CF
                               03CF                                          ; Fill in buffer descriptor:
         08 A3    81    D0     03CF          MOVL    (R1)+,CIBD$L_SVAPTE(R3) ;  Addr of PTE mapping buff
      63    81    52    A1     03D3          ADDW3   R2,(R1)+,CIBD$W_FLAGS(R3) ;  Byte offset, access, valid
         04 A3    61    D0     03D7          MOVL    (R1),CIBD$L_BLEN(R3)    ;  Size of buffer
         0C A3    55    D0     03DB          MOVL    R5,CIBD$L_CDRP(R3)      ;  CDRP
                               03DF
50    53  00000000'GF   C3     03DF          SUBL3   G^SCS$GL_BDT,R3,R0      ; Compute index
   50    50    FC 8F    78     03E7          ASHL    #-4,R0,R0               ;  to buffer descriptor
50    10    10    02 A3 F0     03EC          INSV    CIBD$W_KEY(R3),#16,#16,R0  ; Put seq # in h.o. bits
                               03F2                                          ;  to make buffer name
         53    2C A5    D0     03F2          MOVL    CDRP$L_LBUFH_AD(R5),R3  ; Get buffer handle to fill in
                               03F6
```

```
                      03F6  1298           ASSUME  CIBHAN$L_BOFF+4 EQ CIBHAN$L_BNAME
                      03F6  1299           ASSUME  CIBHAN$L_BNAME+4 EQ CIBHAN$L_RCONID
                      03F6  1300
             83   D4  03F6  1301           CLRL    (R3)+                     ; Clear transfer offset
          83 50   D0  03F8  1302           MOVL    R0,(R3)+                  ; Copy buffer name
    50    24 A5   D0  03FB  1303           MOVL    CDRP$L_CDT(R5),R0         ; Get CDT addr
    63    14 A0   D0  03FF  1304           MOVL    CDT$L_RCONID(R0),(R3)     ; Put CONID into handle
0094 C0      61   C0  0403  1305           ADDL    (R1),CDT$L_BYTMAPD(R0)    ; Incr count of total bytes mapped
                      0408  1306                                             ;  by the # bytes just mapped
             53 8ED0  0408  1307           POPL    R3                        ; Restore SYSAP's R3
          18 B5   17  040B  1308           JMP     @CDRP$L_SAVD_RTN(R5)      ; Return to SYSAP
                      040E  1309
                      040E  1310 WAIT_BD:
                      040E  1311
             51   DD  040E  1312           PUSHL   R1                        ; Save SVAPTE arg temporarily
    51    2C A5   D0  0410  1313           MOVL    CDRP$L_LBUFH_AD(R5),R1    ; Get buffer handle addr
             61 8ED0  0414  1314           POPL    CIBHAN$L_BOFF(R1)         ; Copy SVAPTE and access mode to
    08 A1    52   D0  0417  1315           MOVL    R2,CIBHAN$L_RCONID(R1)    ;  handle for duration of suspend
          04 A1   D4  041B  1316           CLRL    CIBHAN$L_BNAME(R1)        ; Zero buffer name to show
                      041E  1317                                             ;  that none is allocated
             53 8ED0  041E  1318           POPL    R3                        ; Restore SYSAP's R3
       51    50   D0  0421  1319           MOVL    R0,R1                     ; Copy BDT addr to register not
                      0424  1320                                             ;  used by $SUSP_SCS macro
    50    24 A5   D0  0424  1321           MOVL    CDRP$L_CDT(R5),R0         ; Get addr of CDT
  009A C0         B6  0428  1322           INCW    CDT$W_QBDT_CNT(R0)        ; Incr count of # times suspend:d
                      042C  1323                                             ;  waiting for BDT
                      042C  1324           $SUSP_SCS       -                 ; Suspend this routine
                      042C  1325                   @CIBDT$L_WAITBL(R1)       ;  on availability of BD
    51    2C A5   D0  0445  1326           MOVL    CDRP$L_LBUFH_AD(R5),R1    ; Get addr of thread's buffer handle
    52    08 A1   D0  0449  1327           MOVL    CIBHAN$L_RCONID(R1),R2    ; Retreive access mode and SVAPTE
       51    61   D0  044D  1328           MOVL    CIBHAN$L_BOFF(R1),R1      ;  saved over the suspend
          FF68    31  0450  1329           BRW     ALLOC_BD                  ; Try to allocate now
                      0453  1330
                      0453  1331           .DSABL  LSB
```

```
0453          .SBTTL  -       FPC$REQDATA,    BLOCK XFER READ
0453          .SBTTL  -       FPC$SENDDATA,   BLOCK XFER WRITE
0453
0453    ;+
0453    ; These two calls are the same except for the direction of
0453    ; the block transfer.  FPC$REQDATA runs as follows:
0453    ;
0453    ; 1.    Using the CDT address specified in the SYSAP's remote buffer
0453    ;       handle, fill in the allcoated message buffer with the REQDAT
0453    ;       opcode, remote station, and all frills set to 0. (512 byte
0453    ;       data pkt, response bit off, path select auto.)  The response
0453    ;       bit = 0 will cause the REQDAT buffer to be put on the free
0453    ;       queue once  it has been sent where it will wait to receive the
0453    ;       DATRET/DATREC notification of transfer completion.
0453    ;
0453    ; 2.    Fill in the sender buffer name and byte offset with info
0453    ;       from the remote buffer handle.  Note that the net buffer offset
0453    ;       is the sum of the offset in the buffer handle and the offset
0453    ;       specified by the SYSAP in the CDRP.  The buffer handle offset
0453    ;       is normally 0.  for third party transfers, it may be transformed
0453    ;       by the SYSAP acting as the manager of the third party transaction
0453    ;       in the case where that SYSAP discovers that it must break a
0453    ;       transfer into transfers from different sources.  The CDRP byte
0453    ;       offset is  ntended for use by a SYSAP doing segmented transfers.
0453    ;
0453    ; 3.    Fill in tne receiver buffer name and byte offset with info
0453    ;       from the local buffer handle.
0453    ;
0453    ; 4.    Set the XCT_ID to the local CONID (from the local buffer handle)
0453    ;       followed by the RSPID from the CDRP.  Set the XCT_LEN to the
0453    ;       value specified in the CDRP.
0453    ;
0453    ; 5.    Map the RSPID to the CDRP, save the SYSAP's context in the CDRP;
0453    ;       send the REQDAT message, and return to the caller's caller.
0453    ;       The SYSAP remains suspended until the transfer completes at which
0453    ;       time the SYSAP is resumed at the instruction following the call
0453    ;       to request data.
0453    ;
0453    ; FPC$SENDDATA has its own version of steps 1-3.  In this case the
0453    ; send buffer information is in the local buffer handle and the receive
0453    ; buffer information is in the remote buffer handle.
0453    ;
0453    ; Inputs:
0453    ;
0453    ;       R4                      -PDT addr
0453    ;       R5                      -CDRP addr
0453    ;
0453    ;       CDRP$L_RSPID            -RSPID to use to correlate tramsfer
0453    ;                                completion with initiation thread
0453    ;       CDRP$L_MSG_BUF          -Message buffer to use for xfer command
0453    ;       CDRP$L_XCT_LEN          -# bytes to xfer
0453    ;       CDRP$L_LBUFH_AD         -Addr of local buffer handle
0453    ;       CDRP$L_LBOFF            -Local byte offset for segmentation
0453    ;       CDRP$L_RBUFH_AD         -Addr of remote buffer handle
0453    ;       CDRP$L_RBOFF            -Remote byte offset for segmentation
0453    ;
0453    ; Outputs:
```

```
                              0453    ;
                              0453    ;          R0                       -Status:  SS$_NORMAL, SS$_ILLPORTOPR
                              0453    ;          R1, R2                   -Destroyed
                              0453    ;          R3                       -Preserved
                              0453    ;          R4                       -PDT addr
                              0453    ;          R5                       -CDRP addr
                              0453    ;
                              0453    ;          RSPID, msg buffer        -Deallocated
                              0453    ;
                              0453    ;          CDRP$L_MSG_BUF(R5)       ;Zeroed to show msg buffer gone
                              0453    ;-
                              0453
                              0453               .ENABL  LSB
                              0453
                              0453    FPC$REQDATA::
                              0453
                 53      DD   0453               PUSHL   R3                       ; Save SYSAP's R3
      51      34 A5      D0   0455               MOVL    CDRP$L_RBUFH_AD(R5),R1   ; Get addr of remote buffer handle
      53      08 A1      3C   0459               MOVZWL  CIBHAN$L_RCONID(R1),R3   ; COmpute addr of CDT
50    00000000'GF        D0   045D               MOVL    G^SCS$GL_CDL,R0          ;  specified by local
      53    6043         D0   0464               MOVL    (R0)[R3],R3              ;  buffer handle
          008C C3        D6   0468               INCL    CDT$L_REQDATS(R3)        ; Incr number of request datas issued
            3C A5        C0   046C               ADDL    CDRP$L_XCT_LEN(R5),-     ; Step count of # bytes xferred via
          0090 C3             046F                       CDT$L_BYTREQD(R3)        ;  all request datas
      51      34 A5      D0   0472               MOVL    CDRP$L_RBUFH_AD(R5),R1   ; Get addr of remote buffer handle
      52      1C A5      D0   0476               MOVL    CDRP$L_MSG_BUF(R5),R2    ; Set pointer to SCS area
              04 A1      D0   047A               MOVL    CIBHAN$L_BNAME(R1),-     ; Set send buffer name
              FC A2           047D                       SCS$L_SND_NAME(R2)       ;  to remote
                 61      C1   047F               ADDL3   CIBHAN$L_BOFF(R1),-      ; Set send byte offset to
              38 A5           0481                       CDRP$L_RBOFF(R5),-       ;  xfer offset +
                 62           0483                       SCS$L_SND_BOFF(R2)       ;  segmentation
      51      2C A5      D0   0484               MOVL    CDRP$L_LBUFH_AD(R5),R1   ; Get local buffer handle
              04 A1      D0   0488               MOVL    CIBHAN$L_BNAME(R1),-     ; Set receive buffer name
              04 A2           048B                       SCS$L_REC_NAME(R2)       ;  to local
                 61      C1   048D               ADDL3   CIBHAN$L_BOFF(R1),-      ; Set receive byte offset to
              30 A5           048F                       CDRP$L_LBOFF(R5),-       ;  xfer offset
              08 A2           0491                       SCS$L_REC_BOFF(R2)       ;  + segmentation
   50     0000'CF        9E   0493               MOVAB   W^INT$REQDAT,R0          ; Addr of PPD action routine
                 45      11   0498               BRB     COMMON_XFER              ; Join common code
                              049A
                              049A    FPC$SENDDATA::
                              049A
                 53      DD   049A               PUSHL   R3                       ; Save SYSAP's R3
      51      34 A5      D0   049C               MOVL    CDRP$L_RBUFH_AD(R5),R1   ; Get addr of remote buffer handle
      53      08 A1      3C   04A0               MOVZWL  CIBHAN$L_RCONID(R1),R3   ; COmpute addr of CDT
50    00000000'GF        D0   04A4               MOVL    G^SCS$GL_CDL,R0          ;  specified by local
      53    6043         D0   04AB               MOVL    (R0)[R3],R3              ;  buffer handle
          0084 C3        D6   04AF               INCL    CDT$L_SNDDATS(R3)        ; Incr total # send datas issued
            3C A5        C0   04B3               ADDL    CDRP$L_XCT_LEN(R5),-     ; Step count of total bytes xferred via
          0088 C3             04B6                       CDT$L_BYTSENT(R3)        ;  send datas
      51      34 A5      D0   04B9               MOVL    CDRP$L_RBUFH_AD(R5),R1   ; Get addr of remote buffer handle
      52      1C A5      D0   04BD               MOVL    CDRP$L_MSG_BUF(R5),R2    ; Get base of buffer
              04 A1      D0   04C1               MOVL    CIBHAN$L_BNAME(R1),-     ; Set receive buffer name
              04 A2           04C4                       SCS$L_REC_NAME(R2)       ;  to remote
                 61      C1   04C6               ADDL3   CIBHAN$L_BOFF(R1),-      ; Set receive byte offset to
              38 A5           04C8                       CDRP$L_RBOFF(R5),-       ;  xfer offset +
              08 A2           04CA                       SCS$L_REC_BOFF(R2)       ;  segmentation
```

```
    51    2C A5    D0  04CC  1447          MOVL    CDRP$L_LBUFH_AD(R5),R1   ; Get local buffer handle
          04 A1    D0  04D0  1448          MOVL    CIBHAN$L_BNAME(R1),-     ; Set send buffer name
          FC A2        04D3  1449                  SCS$L_SND_NAME(R2)       ;  to local
             61    C1  04D5  1450          ADDL3   CIBHAN$L_BOFF(R1),-      ; Set send byte offset to
          30 A5        04D7  1451                  CDRP$L_LBOFF(R5),-       ;  xfer offset +
             62        04D9  1452                  SCS$L_SND_BOFF(R2)       ;  segmentation
   50   0000'CF    9E  04DA  1453          MOVAB   W^INT$SNDDAT,R0          ; Addr of PPD action routine
                       04DF  1454
                       04DF  1455  COMMON_XFER:
                       04DF  1456
                       04DF  1457          $CHK_CDTSTATE   -                ; Verify connection state is
                       04DF  1458                  OPEN,-                   ;  open.
                       04DF  1459                  ERROR=STATE_ERR_R3,-     ; Else notify caller
                       04DF  1460                  CDT=R3
          18 A3    D0  04E8  1461          MOVL    CDT$L_LCONID(R3),-       ; Set transaction ID =
          F0 A2        04EB  1462                  SCS$L_LCONID(R2)         ;  local CONID followed
          20 A5    D0  04ED  1463          MOVL    CDRP$L_RSPID(R5),-       ;  by RSPID
          F4 A2        04F0  1464                  SCS$L_RSPID(R2)
          3C A5    D0  04F2  1465          MOVL    CDRP$L_XCT_LEN(R5),-     ; Set transfer size
          F8 A2        04F5  1466                  SCS$L_XCT_LEN(R2)
    51    1C A3    D0  04F7  1467          MOVL    CDT$L_PB(R3),R1          ; Get address of PB in R1
             60    16  04FB  1468          JSB     (R0)                     ; Call the PPD layer
          1C A5    D4  04FD  1469          CLRL    CDRP$L_MSG_BUF(R5)       ; Zero msg buffer addr
             53  8ED0  0500  1470          POPL    R3                       ; Restore SYSAP's R3
                       0503  1471          $SUSP_FP                         ; Suspend caller
                       050C  1472
                       050C  1473          .DSABL  LSB
```

```
                               050C          .SBTTL  -      UNMAP,         UNMAP A BUFFER
                               050C
                               050C     ;+
                               050C     ; UNMAP converts the buffer name specified in the local buffer handle
                               050C     ; to a buffer descriptor address.  If the buffer descriptor is not
                               050C     ; good (sequence number check), then the routine bugchecks.  Otherwise,
                               050C     ; the descriptor valid bit is cleared, the sequence number incremented,
                               050C     ; and the descriptor is linked to the free list.  Any CDRP waiting for
                               050C     ; a buffer descriptor is resumed.
                               050C     ;
                               050C     ; Inputs:
                               050C     ;
                               050C     ;       R4                      -PDT addr
                               050C     ;       R5                      -CDRP addr
                               050C     ;
                               050C     ;       CDRP$L_LBUFH_AD         -Addr of local buffer handle
                               050C     ;
                               050C     ; Outputs:
                               050C     ;
                               050C     ;       R0-R2                   -Destroyed
                               050C     ;       Other registers         -Preserved
                               050C     ;
                               050C     ;       CIBHAN$L_BNAME          -Zeroed
                               050C     ;-
                               050C
                               050C             .ENABL  LSB
                               050C
                               050C     FPC$UNMAP::
                               050C
          51    2C A5   D0     050C             MOVL    CDRP$L_LBUFH_AD(R5),R1  ; Get addr of local buff handle
          52    04 A1   D0     0510             MOVL    CIBHAN$L_BNAME(R1),R2   ; Get buffer name
                   49   13     0514             BEQL    30$                     ; Branch if none allocated
             52    52   3C     0516             MOVZWL  R2,R2                   ; Isolate BD index
    50   00000000'GF    D0     0519             MOVL    G^SCS$GL_BDT,R0         ; Get addr of BDT
          F8 A0    52   D1     0520             CMPL    R2,CIBDT$L_MAXIDX(R0)   ; Index greater than maximum?
                   3A   14     0524             BGTR    BD_SEQ_ERROR            ; Branch if so, same as bad seq number
                               0526
                               0526             ASSUME  CIBD$C_LENGTH EQ 16
                               0526
             52    52   C0     0526             ADDL    R2,R2                   ; Prepare for net 16 byte index
           52    6042   7E     0529             MOVAQ   (R0)[R2],R2             ; Get addr of BD
                02 A2   B1     052D             CMPW    CIBD$W_KEY(R2),-        ; Sequence # in BD =
                06 A1          0530                     CIBHAN$L_BNAME+2(R1)    ;  that in buffer handle?
                   2C   12     0532             BNEQ    BD_SEQ_ERROR            ; Branch if not
                02 A2   B6     0534             INCW    CIBD$W_KEY(R2)          ; Step sequence number
                   03   12     0537             BNEQ    10$                     ; Branch if nonzero
                02 A2   B6     0539             INCW    CIBD$W_KEY(R2)          ; Else step again
                               053C
                   0F   E5     053C     10$:    BBCC    #CIBD$V_V,-             ; Clear valid bit
                00 62          053E                     CIBD$W_FLAGS(R2),20$    ;
                               0540
                F4 A0   D0     0540     20$:    MOVL    CIBDT$L_FREEBD(R0),-    ; Link this BD to
                0C A2          0543                     CIBD$L_LINK(R2)         ;  free list
          F4 A0    52   D0     0545             MOVL    R2,CIBDT$L_FREEBD(R0)   ;
                04 A1   D4     0549             CLRL    CIBHAN$L_BNAME(R1)      ; Zero buffer name to show
                               054C                                             ;  none mapped
                               054C             $RESUME_FP      -               ; Resume waiter, if nay
```

```
     054C                          @CIBDT$L_WAITFL(R0)      ;
     055F
05   055F  30$:     RSB                                     ; Return to caller
     0560
     0560  BD_SEQ_ERROR:                                    ; SYSAP tried to unmap buffer
     0560                                                   ;
     0560           BUGCHECK  CIPORT,NONFATAL               ;  without right key -- leave
     0567                                                   ;  buffer descriptor permanently
     0567                                                   ;  allocated and do nothing to it.
     0567
05   0567  40$:     RSB                                     ;  return to caller
     0568
     0568           .DSABL  LSB
```

```
                      0568          .SBTTL  -       SUSP_CONCALL,   SUSPEND CONNECTION
                      0568          .SBTTL  -                       MANAGEMENT CALL
                      0568
                      0568  ;+
                      0568  ; Connection management calls assume that the SYSAP's fork process
                      0568  ; consists of R3 = CDT address, R4 = PDT address, R5, and (SP) =
                      0568  ; return from the connection management call.  R3 is automatically
                      0568  ; restored by the event (response) triggering call completion;  R4
                      0568  ; is restorable from the CDT.  Therefore, the only context saved is
                      0568  ; R5 and return from call.
                      0568  ;
                      0568  ; Inputs:
                      0568  ;
                      0568  ;       R3                      -CDT addr
                      0568  ;       R4                      -PDT addr
                      0568  ;       R5                      -SYSAP's R5
                      0568  ;       (SP)                    -SYSAP PC
                      0568  ;
                      0568  ; Outputs:
                      0568  ;
                      0568  ;       R5, (SP)+               -Saved in CDT
                      0568  ;       Return to caller's caller
                      0568  ;-
                      0568
                      0568          .ENABL  LSB
                      0568
                      0568  SUSP_CONCALL:
                      0568
 68 A3   55   D0      0568          MOVL    R5,CDT$L_FR5(R3)        ; Save SYSAP R5
     64 A3 8ED0       056C          POPL    CDT$L_FPC(R3)           ; Save SYSAP PC and remove it from stack
             05       0570          RSB                             ; Return to caller's caller
                      0571
                      0571          .DSABL  LSB
```

```
                          0571           .SBTTL  -       STATE_ERR,      RETURN CDT STATE ERROR
                          0571           .SBTTL  -                       TO SYSAP
                          0571
                          0571      ;+
                          0571      ; Set error status code and return to caller.
                          0571      ;-
                          0571
                          0571      STATE_ERR_R3:                        ; Entry if caller's R3 is saved on stack
                          0571
                 53 8ED0  0571           POPL    R3                      ; Restore R3 for caller
                          0574
                          0574      STATE_ERR:
                          0574
      50   2154 8F    3C  0574           MOVZWL  #SS$_ILLCDTST,R0        ; Status = illegal CDT state
                      05  0579           RSB                             ; Return to SYSAP
```

```
057A          .SBTTL  MAINTENANCE FUNCTION CALLS
057A          .SBTTL  -        FPC$READCOUNT,  READ AND LOCK
057A          .SBTTL  -                        PORT COUNTERS
057A
057A    ;+
057A    ; This routine is called by a SYSAP to reset the port counters to begin
057A    ; counting ACKS/NAKS/NO_RESPONSES on each path and total datagrams discarded
057A    ; from a particular port or all ports.  The SYSAP 'owns' the counters until it
057A    ; does a RLS_COUNTERS call.  If another SYSAP owns the counters, then
057A    ; error status is returned to the SYSAP.
057A    ;
057A    ; Note that this is an unusual fork process call in that the SYSAP hands
057A    ; FPC$READCOUNT the base of the PPD  layer of the dg pkt, and receives
057A    ; back the PPD layer address of the counters read response.  The reason
057A    ; is that in this one case the application data is entirely port specific.
057A    ; The mechanism for managing counter ownership is all that is assumed to
057A    ; be port independent and hence can be handled in this module (which must
057A    ; be port independent.)  The packet address is simply passed through this
057A    ; layer to the PPD layer without being used in any way.  Future port
057A    ; implementations may have different counter management and, in that
057A    ; case counter ownership book keeping would also have to migrate into
057A    ; the PPD layer.
057A    ;
057A    ; Inputs:
057A    ;
057A    ;       R0                          -Addr of remote station to count for;
057A    ;                                    0 addr means count for all stations
057A    ;       R1                          -Addr of local process name
057A    ;       R2                          -Addr of base of datagram sized buffer
057A    ;                                    (PPD layer)
057A    ;       R4                          -Addr of PDT
057A    ;       R5                          -Addr of CDRP
057A    ;
057A    ; Outputs:
057A    ;
057A    ;       R0                          -Status:  SS$_NORMAL, SS$_INTERLOCK,
057A    ;                                    SS$_NOSUCHNODE
057A    ;       R2                          -Addr of datagram buffer, current counters
057A    ;                                    to all ports since last release
057A    ;       R1                          -Destroyed
057A    ;
057A    ;       Other registers             -Preserved
057A    ;
057A    ;       PDT$B_FLAGS(R4)             -Counters busy flag set
057A    ;       PDT$T_CNTOWNER(R4)          -Name of owning SYSAP
057A    ;
057A    ;       PPD$L_P0_ACK(R2)            -ACKS on path 0
057A    ;       PPD$L_P0_NAK(R2)            -NAKS on path 0
057A    ;       PPD$L_P0_NRSP(R2)           -No responses on path 0
057A    ;       PPD$L_P1_ACK(R2)            -ACKS on path 1
057A    ;       PPD$L_P1_NAK(R2)            -NAKS on path 1
057A    ;       PPD$L_P1_NRSP(R2)           -No responses on path 1
057A    ;       PPD$L_DG_DISC(R2)           -Datagrams discarded
057A    ;-
057A
057A            .ENABL  LSB
057A
```

```
                      057A  FPC$READCOUNT::
                      057A
           00    E2   057A          BBSS    #PDT$V_CNTBSY,-            ; Branch if counters busy; else
   23 00C0 C4         057C                  PDT$W_FLAGS(R4),BSY_ERR ;  set busy and continue
 00C4 C4   81    7D   0580          MOVQ    (R1)+,PDT$T_CNTOWNER(R4);  Save new owner's name
 00CC C4   61    7D   0585          MOVQ    (R1),PDT$T_CNTOWNER+8(R4)
                      058A
           02    AA   058A  10$:    BICW    #PDT$M_CNTRLS,-            ; Clear release pending
      00C0 C4         058C                  PDT$W_FLAGS(R4)            ;
                      058F
                      058F  ISSUE_RDCNT:
                      058F
        FA6E'    30   058F          BSBW    INT$READCNT                ; Issue command to port
        25 50    E9   0592          BLBC    R0,30$                     ; If error, leave now
 00D4 C4   55    D0   0595          MOVL    R5,PDT$L_CNTCDRP(R4)       ; Save caller's CDRP addr
                      059A          $SUSP_FP                           ; Save fork process' context
                      05A3                                             ;  till response arrives
                      05A3
                      05A3  BSY_ERR:
                      05A3
           0D    BB   05A3          PUSHR   #^M<R0,R2,R3>              ; Save registers for CMPC
      61   10    29   05A5          CMPC3   #16,(R1),-                 ; Is current owner = requestor?
      00C4 C4         05A8                  PDT$T_CNTOWNER(R4)         ;
           50    D5   05AB          TSTL    R0                         ; Check compare result
           04    12   05AD          BNEQ    20$                        ; Branch if requestor not owner
           0D    BA   05AF          POPR    #^M<R0,R2,R3>              ; Restore registers
           D7    11   05B1          BRB     10$                        ; Continue with request
                      05B3
           0D    BA   05B3  20$:    POPR    #^M<R0,R2,R3>              ; Restore registers
 50   038C 8F    3C   05B5          MOVZWL  #SS$_INTERLOCK,R0          ; Else set error status
           05         05BA  30$:    RSB                                ; Return to SYSAP
                      05BB
                      05BB          .DSABL  LSB
```

```
                    05BB         .SBTTL  -       FPC$RLSCOUNT,   READ AND RELEASE
                    05BB         .SBTTL  -                       PORT COUNTERS
                    05BB
                    05BB    ;+
                    05BB    ; FPC$RLSCOUNT has the same function as FPC$READCOUNT except that the
                    05BB    ; caller is asusmed to already own the counters so no check is done, and
                    05BB    ; the port is reset to count all ports again.  (Count all is t'e default
                    05BB    ; while the counters are unowned.)
                    05BB    ;
                    05BB    ; Inputs:
                    05BB    ;
                    05BB    ;       R2                              -Addr of base of dg sized buffer
                    05BB    ;       R4                              -Addr of PDT
                    05BB    ;       R5                              -Addr of CDRP
                    05BB    ;
                    05BB    ; Outputs:
                    05BB    ;
                    05BB    ;       R0                              -Status:  SS$_NORMAL
                    05BB    ;       R2                              -Addr of datagram buffer filled
                    05BB    ;                                        as specified in FPC$READCOUNT
                    05BB    ;       R1                              -Destroyed
                    05BB    ;
                    05BB    ;       Other registers                 -Preserved
                    05BB    ;-
                    05BB
                    05BB            .ENABL  LSB
                    05BB
                    05BB    FPC$RLSCOUNT::
                    05BB
      02     A8     05BB            BISW    #PDT$M_CNTRLS,-         ; Set count release pending
 00C0 C4            05BD                    PDT$W_FLAGS(R4)         ;
      50     D4     05C0            CLRL    R0                      ; Set port to count all ports
      CB     11     05C2            BRB     ISSUE_RDCNT             ; Go give read count command
                    05C4
                    05C4            .DSABL  LSB
```

```
                   05C4         .SBTTL  -       FPC$MRESET,     RESET REMOTE PORT/SYSTEM
                   05C4
                   05C4   ;+
                   05C4   ; FPC$MRESET allocates a datagram buffer and uses it to send
                   05C4   ; a maintenacne reset to the specified remote port.
                   05C4   ;
                   05C4   ; Inputs:
                   05C4   ;
                   05C4   ;     R0                      -0/1 for dont/do force reset
                   05C4   ;     R1                      -Addr of remote station to reset
                   05C4   ;     R4                      -Addr of PDT
                   05C4   ;
                   05C4   ; Outputs:
                   05C4   ;
                   05C4   ;     R0                      -Status:  SS$_NORMAL, SS$_INSFMEM,
                   05C4   ;                              SS$_NOSUCHNODE
                   05C4   ;     R1,R2                   -Destroyed
                   05C4   ;
                   05C4   ;     Other registers         -Preserved
                   05C4   ;-
                   05C4
                   05C4         .ENABL  LSB
                   05C4
                   05C4   FPC$MRESET::
                   05C4
       53     DD   05C4         PUSHL   R3                      ; Save SYSAP register
  0000'CF     9F   05C6         PUSHAB  W^INT$MRESET            ; PPD action routine
       06     11   05CA         BRB     10$                     ; Join commond code
```

```
                    05CC          .SBTTL  -       FPC$MSTART,     SEND START TO REMOTE
                    05CC          .SBTTL  -                       SYSTEM
                    05CC
                    05CC    ;+
                    05CC    ; FPC$MSTART allocates a datagram buffer and sends a start command
                    05CC    ; to the specified remote port/system.
                    05CC    ;
                    05CC    ; Inputs:
                    05CC    ;
                    05CC    ;       R0                      -1/0 for use default start addr/
                    05CC    ;                                specified start addr
                    05CC    ;       R1                      -Addr of remote station addr
                    05CC    ;       R2                      -Start addr to send if R0 = 0
                    05CC    ;       R4                      -Addr of PDT
                    05CC    ;
                    05CC    ; Outputs:
                    05CC    ;
                    05CC    ;       R0                      -Status:  SS$_NORMAL, SS$_INSFMEM,
                    05CC    ;                                SS$_NOSUCHNODE
                    05CC    ;       R1,R2                   -Destroyed
                    05CC    ;
                    05CC    ;       Other registers         -Preserved
                    05CC    ;-
                    05CC
                    05CC
                    05CC    FPC$MSTART::
                    05CC
          53   DD   05CC            PUSHL   R3                      ; Save SYSAP register
     0000'CF   9F   05CE            PUSHAB  W^INT$MSTART            ; PPD action routine
                    05D2
          07   BB   05D2    10$:    PUSHR   #^M<R0,R1,R2>           ; Save input arguments
        FA29'  30   05D4            BSBW    INT$ALLOC_DG            ; Get a dg buffer
       0B 50   E9   05D7            BLBC    R0,MEM_ERR              ; Branch if none
          0B   BA   05DA            POPR    #^M<R0,R1,R3>           ; Retreive two input arguments
          9E   16   05DC            JSB     @(SP)+                  ; Issue command
        53 8ED0     05DE            POPL    R3                      ; Restore register
       0E 50   E9   05E1            BLBC    R0,PORT_ERR             ; Bad port status
               05   05E4            RSB                             ; Return to SYSAP
                    05E5
                    05E5    MEM_ERR:
                    05E5
          07   BA   05E5            POPR    #^M<R0,R1,R2>           ; Clear input arguments
          8E   D5   05E7            TSTL    (SP)+                   ; Clear PPD routine address
        53 8ED0     05E9            POPL    R3                      ; Restore SYSAP's R3
 50   0124 8F  3C   05EC            MOVZWL  #SS$_INSFMEM,R0         ; Set error status
               05   05F1            RSB                             ;  and return to SYSAP
                    05F2
                    05F2    PORT_ERR:
                    05F2
          50   DD   05F2            PUSHL   R0                      ; Save status
        FA09'  30   05F4            BSBW    INT$DEAL_DG             ; Get rid of the buffer
        50 8ED0     05F7            POPL    R0                      ; Restore status
               05   05FA            RSB
                    05FB
                    05FB            .DSABL  LSB
                    05FB          .SBTTL  -       FPC$STOP_VCS,   SEND SHUTDOWN ON ALL VCS
                    05FB
                    05FB    ;+
                    05FB    ; FPC$STOP_VCS is very port specific.  All we do here is call the port
                    05FB    ; dependent routine, CNF$STOP_VCS which attempts to send a datagram
                    05FB    ; to each known port.  The datagram notifies the remote system that the
                    05FB    ; host is shutting down, so it can notify its SYSAPs promptly of the event.
                    05FB    ;
                    05FB    ; Inputs:
                    05FB    ;
                    05FB    ;       R4                      -PDT address
                    05FB    ;
                    05FB    ; Outputs:
                    05FB    ;
                    05FB    ;       R0-R3                   -Destroyed
                    05FB    ;
                    05FB    ;       Other registers         -Preserved
                    05FB    ;-
                    05FB
                    05FB          .ENABL  LSB
                    05FB
                    05FB    FPC$STOF_VCS::
                    05FB
      FA02'   30    05FB          BSBW    CNF$STOP_VCS            ; Call routine that executes function
              05    05FE          RSB
                    05FF
                    05FF          .DSABL  LSB
```

```
                 05FF          .SBTTL  RECEIVED PACKET ROUTINES
                 05FF          .SBTTL  -       FPC$REC_DGREC,  PROCESS RECEIVED DG
                 05FF
                 05FF  ;+
                 05FF  ; FPC$REC_DGREC verifies the destination connection ID and checks that
                 05FF  ; the connection has at least one datagram queued for receive.  If the
                 05FF  ; connection has no datagrams queued for receive, then the datagram is
                 05FF  ; discarded to the free queue and not given to the SYSAP.  Otherwise,
                 05FF  ; the SYSAP's datagram input address is called.  Upon return from the
                 05FF  ; SYSAP, control is returned to the INTR module to get the next response.
                 05FF  ;
                 05FF  ; Inputs:
                 05FF  ;
                 05FF  ;       R2                      -Addr of message buffer (user portion)
                 05FF  ;       R4                      -Addr of PDT
                 05FF  ;
                 05FF  ; Outputs:
                 05FF  ;
                 05FF  ;       R4                      -Preserved
                 05FF  ;       Other registers         -Destroyed
                 05FF  ;
                 05FF  ;-
                 05FF
                 05FF  ASSUME  SYSAP$C_DGREC EQ 0
                 05FF
                 05FF          .ENABL  LSB
                 05FF
                 05FF  FPC$REC_DGREC::
                 05FF
   013D     30   05FF          BSBW    FPC$CHK_DCONID          ; Verify destination CONID in
                 0602                                          ;  SCS header
  10 50     E9   0602          BLBC    R0,20$                  ; Branch if bad CONID
     50     D4   0605          CLRL    R0                      ; Set flag to show DGREC
  4C A3     B7   0607          DECW    CDT$W_DGREC(R3)         ; Decrement DG receive count
     0A     18   060A          BGEQ    30$                     ; Branch if recv dg's available
  4C A3     B6   060C          INCW    CDT$W_DGREC(R3)         ; Restore correct count
  F9EE'     30   060F          BSBW    INT$INS_DFREEQ          ; Get rid of dg
  78 A3     D6   0612          INCL    CDT$L_DGDISCARD(R3)     ; Step dg discard count
            05   0615  20$:    RSB
                 0616
  74 A3     D6   0616  30$:    INCL    CDT$L_DGRCVD(R3)        ; Step count of total bytes of
                 0619                                          ;  application data received
     09     11   0619          BRB     DGCOM                   ; Join common code
                 061B
                 061B          .DSABL  LSB
```

```
                       061B            .SBTTL  -       FPC$REC_SNDDG, PROCESS SENT DG
                       061B
                       061B  ;+
                       061B  ; FPC$REC_SNDDG verfies the source connection ID.  If correct, R0 is
                       061B  ; set to SYSAP$C_DGSNT to indicate that the datagram is a sent DG
                       061B  ; rather than a new received DG.  The correct length is set in R1.
                       061B  ;
                       061B  ; Inputs:
                       061B  ;
                       061B  ;       R2                              -Addr of dg buffer (user portion)
                       061B  ;       R4                              -Addr of PDT
                       061B  ;
                       061B  ; Outputs:
                       061B  ;
                       061B  ;       R4                              -Preserved
                       061B  ;       Other registers                 -Destroyed
                       061B  ;
                       061B  ;-
                       061B
                       061B            .ENABL  LSB
                       061B
                       061B  FPC$REC_SNDDG::
                       061B
         00FB    30    061B            BSBW    FPC$CHK_SCONID          ; Verify sending connection ID
         14 50   E9    061E            BLBC    R0,10$                  ; Branch if invalid
      50   01    9A    0621            MOVZBL  #SYSAP$C_DGSNT,R0       ; Set flag to indicate DGSNT
                       0624
                       0624  DGCOM:
                       0624
           0E    A3    0624            SUBW3   #SCS$C_OVHD,-           ; Application data = DG length -
     51   F0 A2        0626                    SCS$W_LENGTH(R2),R1     ;  SCS header size
      51   51    3C    0629            MOVZWL  R1,R1                   ; Expand to longword
           54    DD    062C            PUSHL   R4                      ; Save R4(PDT) for REM_NEXT_RSP
        04 B3    16    062E            JSB     @CDT$L_DGINPUT(R3)      ; Call SYSAP  to dispose of dg buffer
         54 8ED0       0631            POPL    R4                      ; Restore
           05          0634            RSB                             ; Return
                       0635
        F9C8'    31    0635  10$:      BRW     INT$INS_DFREEQ          ; Return dg to free queue and
                       0638                                            ;  RSB
                       0638            .DSABL  LSB
```

```
                         0638  1923         .SBTTL  -       FPC$REC_DATREC, PROCESS RECEIVED RETDAT
                         0638  1924         .SBTTL  -       FPC$REC_CNFREC, PROCESS RECEIVED RETCNF
                         0638  1925
                         0638  1926 ;+
                         0638  1927 ; These routines perform the same steps.
                         0638  1928 ;
                         0638  1929 ; First, the CONID portion of the XCT_ID is verified and converted to
                         0638  1930 ; a CDT address.  The RSPID portion of the XCT_ID is converted to the
                         0638  1931 ; response descriptor address and the CDRP address extracted from the
                         0638  1932 ; RD.  The RSPID and message buffer containing the CNFREC/DATREC are
                         0638  1933 ; then deallocated.  Finally, the context of the suspended SYSAP is
                         0638  1934 ; restored and the SYSAP called back at the PC following the call to
                         0638  1935 ; send/request data.
                         0638  1936 ;
                         0638  1937 ; Inputs:
                         0638  1938 ;
                         0638  1939 ;       R2                      -Addr of message buffer (user portion)
                         0638  1940 ;       R4                      -Addr of PDT
                         0638  1941
                         0638  1942 ; Outputs:
                         0638  1943 ;
                         0638  1944 ;       R4                      -Preserved
                         0638  1945 ;       Other registers         -Destroyed
                         0638  1946 ;
                         0638  1947 ;-
                         0638  1948
                         0638  1949         .ENABL  LSB
                         0638  1950
                         0638  1951 FPC$REC_DATREC::
                         0638  1952
                         0638  1953 FPC$REC_CNFREC::
                         0638  1954
          00FE     30    0638  1955         BSBW    FPC$CHK_LCONID          ; Verify transaction ID/CONID
                         063B  1956                                         ;  and get CDT addr
         5A 50     E9    063B  1957         BLBC    R0,STALE_CDT            ; Branch if stale CDT
         40 A3     B6    063E  1958         INCW    CDT$W_SEND(R3)          ; Add implied credit of 1
     51  F4 A2     3C    0641  1959         MOVZWL  SCS$L_RSPID(R2),R1      ; Get RSPID index
50   00000000'GF   D0    0645  1960         MOVL    G^SCS$GL_RDT,R0         ; Get base of RD table
     51   6041     7E    064C  1961         MOVAQ   (R0)[R1],R1             ; Get RD address
         06 A1     B1    0650  1962         CMPW    RD$W_SEQNUM(R1),-       ; Verify
         F6 A2           0653  1963                 SCS$L_RSPID+2(R2)       ;  sequence number
            23     12    0655  1964         BNEQ    RD_SEQ_ERR              ; Branch if bad sequence number
      55    61     D0    0657  1965         MOVL    RD$L_CDRP(R1),R5        ; Get CDRP addr
            52     DD    065A  1966         PUSHL   R2                      ; Save volatile register
                         065C  1967         DEALLOC_RSPID                   ; Deallocate RSPID
          52 8ED0        0662  1968         POPL    R2                      ; Restore register
         F998'     30    0665  1969         BSBW    INT$DEAL_MSG            ; Deallocate msg buffer to
                         0668  1970                                         ;  pool since it is always allocated
                         0668  1971                                         ;  from pool.
      7E    53     7D    0668  1972         MOVQ    R3,-(SP)                ; Save CDT & PDT addr
    53   10 A5     7D    066B  1973         MOVQ    CDRP$L_FR3(R5),R3       ; Restore SYSAP's R3,R4
     50     01     3C    066F  1974         MOVZWL  #SS$_NORMAL,R0          ; Set status to success
         0C B5     16    0672  1975         JSB     @CDRP$L_FPC(R5)         ; Call SYSAP back
      53    8E     7D    0675  1976         MOVQ    (SP)+,R3                ; Restore CDT & PDT addr
            51     11    0678  1977         BRB     CHK_CRWAIT              ; Join common code in REC_MSGREC
                         067A  1978                                         ;  to start anyone waiting for
                         067A  1979                                         ;  send credit, then go for next
```

```
                       067A                                                    ;  response
                       067A  RD_SEQ_ERR:
                       067A
                       067A          $DEBUGCHECK #ERR$V_DEB_XCTER            ; Optionally, bugcheck on this error
52    00B4 C4    C2    068D          SUBL     PDT$L_MSGHDRSZ(R4),R2          ; Back up msg pointer to start of buffer
          F96B'  30    0692          BSBW     CNF$LKP_PB_MSG                 ; Given msg, look up PB if any
          F968'  31    0695          BRW      INT$CRASH_PORT                 ; Crash the port & restart
                       0698
                       0698  STALE_CDT:
                       0698
                 05    0698          RSB                                     ; All cleaned up, just return
                       0699
                       0699          .DSABL  LSB
```

```
                    0699         .SBTTL  -       FPC$REC_MSGREC, PROCESS RECEIVED MSG
                    0699
                    0699  ;+
                    0699  ; FPC$REC_MSGREC checks the SCS message type field.  If the type code
                    0699  ; is SCS$C_APPL_MSG, then processing continues.  Otherwise the message
                    0699  ; is an SCS control message and routine SCS$REC_SCSMSG in called.
                    0699  ;
                    0699  ; For application messages, it checks that the destination connection
                    0699  ; ID is legal.  If not, the message buffer is discarded (returned to
                    0699  ; the free queue) and processing ends.  Otherwise, the connection credit
                    0699  ; bookkeeping is done and the SYSAP's message input address is called.
                    0699  ; The SYSAP is responsible for disposing of the message buffer.  Upon
                    0699  ; return from the SYSAP, REC_MSGREC branches to REM_NEXT_RSP.
                    0699  ;
                    0699  ; Inputs:
                    0699  ;
                    0699  ;       R2                              -Addr of message buffer (user portion)
                    0699  ;       R4                              -Addr of PDT
                    0699  ;
                    0699  ; Outputs:
                    0699  ;
                    0699  ;       R4                              -Preserved
                    0699  ;       Other registers                 -Destroyed
                    0699  ;
                    0699  ;-
                    0699
                    0699         .ENABL  LSB
                    0699
                    0699  FPC$REC_MSGREC::
                    0699
     F4 A2     B1   0699         CMPW    SCS$W_MTYPE(R2),-       ; Is this an application
        0A          069C                 #SCS$C_APPL_MSG         ;  message?
        09     13   069D         BEQL    10$                     ; Branch if yes
        54     DD   069F         PUSHL   R4                      ; Save R4(PDT) for REM_NEXT_RSP
     F95C'     30   06A1         BSBW    SCS$REC_SCSMSG          ; Message is SCS control- go handle
        54   8ED0   06A4         POPL    R4                      ; Restore
               05   06A7         RSB                             ; Get next response
                    06A8
      0094     30   06A8  10$:   BSBW    FPC$CHK_DCONID          ; Verify destination CONID
     37 50     E9   06AB         BLBC    R0,20$                  ; Branch if invalid
     42 A3     B7   06AE         DECW    CDT$W_REC(R3)           ; Decrement send credit held
                    06B1                                         ;  by remote
     F6 A2     A0   06B1         ADDW    SCS$W_CREDIT(R2),-      ; Add credit extended by remote to
     40 A3          06B4                 CDT$W_SEND(R3)          ;  to send credit
   0080 C3     D6   06B6         INCL    CDT$L_MSGRCVD(R3)       ; Incr count of # appl msgs received
        0E     A3   06BA         SUBW3   #SCS$C_OVHD,-
51   F0 A2          06BC                 SCS$W_LENGTH(R2),R1     ; Set size of applicaton data
51      51     3C   06BF         MOVZWL  R1,R1                   ;  for SYSAP
7E      53     7D   06C2         MOVQ    R3,-(SP)                ; Save CDT & PDT address
     00 B3     16   06C5         JSB     @CDT$L_MSGINPUT(R3)     ; Call SYSAP message input address
   53   8E     7D   06C8         MOVQ    (SP)+,R3                ; Retreive CDT & PDT address
                    06CB
                    06CB  CHK_CRWAIT:
                    06CB
     40 A3     B5   06CB         TSTW    CDT$W_SEND(R3)          ; Any send credit?
        15     13   06CE         BEQL    20$                     ; Branch if not
                    06D0         $RESUME_FP      -               ; Else, resume next waiter,
                06D0  2051                      @CDT$L_CRWAITQFL(R3),-   ;
                06D0  2052                      QEMPTY=20$               ;  branching if none.
   E6     11    06E3  2053            BRB       CHK_CRWAIT               ; Check for more credit
                06E5  2054
          05    06E5  2055 20$:       RSB
                06E6  2056
                06E6  2057            .DSABL    LSB
```

```
                          06E6  2059          .SBTTL  -       FPC$REC_SNDMSG, PROCESS SEND MSG
                          06E6  2060
                          06E6  2061  ;+
                          06E6  2062  ; FPC$REC_SNDMSG simply calls FPC$DEALRGMSG to deallocate the sent
                          06E6  2063  ; message.  The deallocate takes care of flow control and may
                          06E6  2064  ; deallocate the buffer to the free queue if the free queue is
                          06E6  2065  ; low, or to pool.
                          06E6  2066  ;
                          06E6  2067  ; Inputs:
                          06E6  2068  ;
                          06E6  2069  ;       R2                      -Addr of message buffer (user portion)
                          06E6  2070  ;       R4                      -Addr of PDT
                          06E6  2071  ;
                          06E6  2072  ; Outputs:
                          06E6  2073  ;
                          06E6  2074  ;       R4                      -Preserved
                          06E6  2075  ;       Other registers         -Destroyed
                          06E6  2076  ;
                          06E6  2077  ;-
                          06E6  2078
                          06E6  2079          .ENABL  LSB
                          06E6  2080
                          06E6  2081  FPC$REC_SNDMSG::
                          06E6  2082
               31    10   06E6  2083          BSBB    FPC$CHK_SCONID          ; Verify source
            03 50    E9   06E8  2084          BLBC    R0,SC_SEQ_ERR           ;  connect ID
             FB3D    31   06EB  2085          BRW     FPC$DEALRGMSG           ; Deallocate buffer
                          06EE  2086
                          06EE  2087  SC_SEQ_ERR:
                          06EE  2088
    52    00B4 C4    C2   06EE  2089          SUBL    PDT$L_MSGHDRSZ(R4),R2   ; Back up message addr to top
                          06F3  2090                                          ;  of buffer from user data
            F90A'    30   06F3  2091          BSBW    CNF$LKP_PB_MSG          ; Given msg, look up PB, if any
            F907'    31   06F6  2092          BRW     INT$CRASH_PORT
                          06F9  2093
                          06F9  2094          .DSABL  LSB
```

```
                      06F9          .SBTTL  -       FPC$REC_RDCNT,  PROCESS RECEIVED RDCNT
                      06F9
                      06F9  ;+
                      06F9  ; FPC$REC_RDCNT returns the received buffer of port counters to the
                      06F9  ; SYSAP that owns the port counters currently.  If the SYSAP specified
                      06F9  ; a release of the counters, then the counters busy flag is cleared.
                      06F9  ;
                      06F9  ; Inputs:
                      06F9  ;
                      06F9  ;       R2                      -Addr of message buffer
                      06F9  ;       R4                      -Addr of PDT
                      06F9  ;       PDT$L_CNTCDRP(R4)       -CDRP holding suspended SYSAP context
                      06F9  ;
                      06F9  ; Outputs:
                      06F9  ;
                      06F9  ;       R4                      -Preserved
                      06F9  ;       Other registers         -Destroyed
                      06F9  ;       PDT$W_FLAGS(R4)         -If PDT$M_CNTRLS is set then PDT$M_CNTRLS
                      06F9  ;                                and PDT$M_CNTBSY are both cleared
                      06F9  ;-
                      06F9
                      06F9          .ENABL  LSB
                      06F9
                      06F9  FPC$REC_RDCNT::
                      06F9
           01    E5   06F9          BBCC    #PDT$V_CNTRLS,-         ; Branch if no release of
   05 00C0 C4         06FB                  PDT$W_FLAGS(R4),10$     ;  counters is pending
           01    AA   06FF          BICW    #PDT$M_CNTBSY,-         ; Else this is a release --
      00C0 C4         0701                  PDT$W_FLAGS(R4)         ;  clear counters busy
                      0704
55   00D4 C4     D0   0704  10$:    MOVL    PDT$L_CNTCDRP(R4),R5    ; Get SYSAP's CDRP
      50   01    3C   0709          MOVZWL  #SS$_NORMAL,R0          ; Set success status for SYSAP
           54    DD   070C          PUSHL   R4                      ; Save PDT addr
   53   10 A5    7D   070E          MOVQ    CDRP$L_FR3(R5),R3       ; Get SYSAP's saved R3, R4
        0C B5    16   0712          JSB     @CDRP$L_FPC(R5)         ; Call SYSAP back with results
           54  8ED0   0715          POPL    R4                      ; Retreive PDT addr
                 05   0718          RSB
                      0719
                      0719          .DSABL  LSB
```

```
                          0719          .SBTTL  MISC. ROUTINES
                          0719          .SBTTL  -       FPC$CHK_SCONID, CHECK SENDER CONID
                          0719          .SBTTL  -       FPC$CHK_DCONID, CHECK DESTINATION CONID
                          0719          .SBTTL  -       FPC$CHK_LCONID, CHECK CONID IN LCONID
                          0719
                          0719  ;+
                          0719  ; FPC$CHK_SCONID -- Verifies the sender connection ID in the SCS
                          0719  ;                   header and returns the address of the CDT
                          0719  ; FPC$CHK_DCONID -- Verifies the destination connection ID in the SCS
                          0719  ;                   header and returns the address of the CDT
                          0719  ; FPC$CHK_LCONID -- Verifies the connection ID in the CONID portion
                          0719  ;                   of an XCT_ID in a block xfer message. (First
                          0719  ;                   longword of XCT_ID)
                          0719  ;
                          0719  ; The connection ID index (l.o. word) is extracted and compared
                          0719  ; with the maximum index number.  If it exceeds the maximum index,
                          0719  ; return error.  Else, compute the CDT address from the index.
                          0719  ; Check the sequence # in the CDT.  If they agree, return success.
                          0719  ; Else return error.
                          0719  ;
                          0719  ; Inputs:
                          0719  ;
                          0719  ;       R2                      -Addr of message/datagram buffer
                          0719  ;       R4                      -Addr of PDT
                          0719  ;
                          0719  ; Outputs:
                          0719  ;
                          0719  ;       R0                      -1/0 for success/fail
                          0719  ;       R1                      -Destroyed
                          0719  ;       R2                      -Addr of msg/dg (CHK_SCONID)
                          0719  ;                                Addr of msg/dg iff success (CHK_D/l CONID)
                          0719  ;       R3                      -Addr of CDT if success
                          0719  ;       Other registers         -Preserved
                          0719  ;-
                          0719
                          0719          .ENABL  LSB
                          0719
                          0719  FPC$CHK_SCONID:
                          0719
     51   FC A2     3C    0719          MOVZWL  SCS$L_SRC_CONID(R2),R1  ; Get source connection ID index
 53   00000000'GF   D0    071D          MOVL    G^SCS$GL_CDL,R3         ; Get addr of connx descriptor list
     F0 A3    51    B1    0724          CMPW    R1,CDL$W_MAXCONIDX(R3)  ; Compare index with maximum
              48    1A    0728          BGTRU   BAD_SCONID              ; Branch if index is too big
       53   6341    D0    072A          MOVL    (R3)[R1],R3             ; Turn index to CDT address
           18 A3    D1    072E          CMPL    CDT$L_LCONID(R3),-      ; ID in msg/dg matches ID in CDT?
           FC A2          0731                  SCS$L_SRC_CONID(R2)     ;
              3D    12    0733          BNEQ    BAD_SCONID              ; Branch if not
        50    01    3C    0735          MOVZWL  #SS$_NORMAL,R0          ; Else success status
                    05    0738          RSB
                          0739
                          0739  FPC$CHK_LCONID:
                          0739
     50   F0 A2     D0    0739          MOVL    SCS$L_LCONID(R2),R0     ; Extract CONID from message
              04    11    073D          BRB     10$                     ; Join common code
                          073F
                          073F  FPC$CHK_DCONID::
                          073F
```

```
          50   F8 A2    D0 073F          MOVL    SCS$L_DST_CONID(R2),R0  ; Get destination connection ID
                           0743
             51   50    3C 0743 10$:     MOVZWL  R0,R1                   ; Extract index
     53    00000000'GF  D0 0746          MOVL    G^SCS$GL_CDL,R3         ; Get addr of connx descriptor list
           F0 A3   51   B1 074D          CMPW    R1,CDL$W_MAXCONIDX(R3)  ; Compare index with maximum
                   0E   1A 0751          BGTRU   BAD_CONID               ; Branch if index is too big
            53   6341   D0 0753          MOVL    (R3)[R1],R3             ; Turn index to CDT address
          50   18 A3    D1 0757          CMPL    CDT$L_LCONID(R3),R0     ; ID in msg/dg matches ID in CDT?
                   04   12 075B          BNEQ    BAD_CONID               ; Branch if not
              50   01   3C 075D          MOVZWL  #SS$_NORMAL,R0          ; Else success status
                        05 0760          RSB                             ; Return
                           0761
                           0761 BAD_CONID:
                           0761
                F4 A2   B1 0761          CMPW    SCS$W_MTYPE(R2),-       ; Is this an application datagram?
                   0B      0764                  #SCS$C_APPL_DG          ;
                   05   13 0765          BEQL    20$                     ; Branch if so
                 F896'  30 0767          BSBW    INT$INS_MFREEQ          ; Return message buffer to free queue
                   03   11 076A          BRB     30$                     ; Join common exit
                           076C
                 F891'  30 076C 20$:     BSBW    INT$INS_DFREEQ          ; Return dg buffer to free queue
                           076F
                   50   D4 076F 30$:     CLRL    R0                      ; Set status to failure
                        05 0771          RSB                             ; Return
                           0772
                           0772 BAD_SCONID:
                           0772
                           0772          $DEBUGCHECK #ERR$V_DEB_SCERR    ; Optionally, bugcheck on this error
                   E8   11 0785          BRB     30$                     ; To recover, go return error to caller
                           0787
                           0787          .DSABL LSB
```

```
                              0787        .SBTTL  FPC$INITIAL,    INITIALIZE AT THIS LAYER
                              0787        .SBTTL  -       BUILD BDT
                              0787
                              0787  ;+
                              0787  ; The buffer descriptor table is shared among CI ports.  If it does
                              0787  ; not already exist, allocate and initialize it.
                              0787  ;-
                              0787
                              0787  ASSUME  CIBDT$L_WAITFL+4   EQ     CIBDT$L_WAITBL
                              0787  ASSUME  CIBDT$L_WAITBL+4   EQ     CIBDT$W_SIZE
                              0787  ASSUME  CIBDT$W_SIZE+2     EQ     CIBDT$B_TYPE
                              0787  ASSUME  CIBDT$B_TYPE+1     EQ     CIBDT$B_SUBTYP
                              0787  ASSUME  CIBDT$B_SUBTYP+1   EQ     CIBDT$L_FREEBD
                              0787  ASSUME  CIBDT$L_FREEBD+4   EQ     CIBDT$L_MAXIDX
                              0787  ASSUME  CIBDT$L_MAXIDX+8   EQ     CIBDT$C_BDLIST
                              0787
                              0787        .ENABL  LSB
                              0787
                              0787  FPC$INITIAL::
                              0787
       00000000'GF      D5    0787        TSTL    G^SCS$GL_BDT                ; Got buffer descriptors already?
                6D      12    078D        BNEQ    40$                         ; Branch if so
  51   00000000'GF      3C    078F        MOVZWL  G^SCS$GW_BDTCNT,R1          ; Get # of buffer descriptors
                51      DD    0796        PUSHL   R1                          ; Save it
     51    51   04      78    0798        ASHL    #4,R1,R1                    ; Get # bytes of descriptors
                51  18  C0    079C        ADDL    #CIBDT$C_LENGTH,R1          ;  + BDT header length
       00000000'GF      16    079F        JSB     G^EXE$ALONONPAGED           ; Allocate pool for descriptors
             57  50     E9    07A5        BLBC    R0,50$                      ; Branch if failure
                52      DD    07A8        PUSHL   R2                          ; Save addr of BDT
           82   52      D0    07AA        MOVL    R2,(R2)+                    ; Set BD wait queue
        82    FC A2     DE    07AD        MOVAL   -4(R2),(R2)+                ;  listhead emptyp
           82   51      B0    07B1        MOVW    R1,(R2)+                    ; Set structure size,
     82    0161 8F      B0    07B4        MOVW    #<DYN$C_CI_BDT@8 + DYN$C_CI>,(R2)+  ;  type, and subtype
                82      D4    07B9        CLRL    (R2)+                       ; Clear ptr for later
        62    04 AE     D0    07BB        MOVL    4(SP),(R2)                  ; Set # buffer descriptors
                82      D7    07BF        DECL    (R2)+                       ; Max index = # BD's-1
                82      D4    07C1        CLRL    (R2)+                       ; Clear reserved longwd
  00000000'GF   52      D0    07C3        MOVL    R2,G^SCS$GL_BDT             ; Save addr in system wide data base
                51    8ED0    07CA        POPL    R1                          ; Get BDT address again
  50   00000000'GF      D0    07CD        MOVL    G^SCS$GL_CDL,R0             ; Get addr of connx descriptor list
           50   60      D0    07D4        MOVL    (R0),R0                     ;  and addr of first CDT.
        50    1A A0     3C    07D7        MOVZWL  CDT$L_LCONID+2(R0),R0       ; Get that CDT's sequence number
        50    5A 8F     8C    07DB        XORB2   #^X5A,R0                    ; Make it unique
                6E      D5    07DF        TSTL    (SP)                        ; Get # buffer descriptors
                14      13    07E1        BEQL    30$                         ; Branch if zero
                              07E3
                              07E3  ;
                              07E3  ; Loop to initialize buffer descriptors links all BD's onto the
                              07E3  ; free list rooted at CIBDT$L_FREEBD, marks each BD invalid, and
                              07E3  ; initializes the BD sequence number
                              07E3  ;
                              07E3
                62      B4    07E3  20$:  CLRW    CIBD$W_FLAGS(R2)            ; Clear valid bit
        02 A2   50      B0    07E5        MOVW    R0,CIBD$W_KEY(R2)           ;  Init sequence #
        0C A1   52      D0    07E9        MOVL    R2,CIBD$L_LINK(R1)          ; Link this BD to previous
           51   52      D0    07ED        MOVL    R2,R1                       ; Set this BD to previous
        52    10 A2     DE    07F0        MOVAL   CIBD$C_LENGTH(R2),R2        ; Step to next BD
```

```
          EC 6E    F5  07F4  2282        SOBGTR  (SP),20$                 ; Branch if more BD's to do
                       07F7  2283
          0C A1    D4  07F7  2284 30$:   CLRL    C1BD$L_LINK(R1)          ; Zero last fwd link
             8E    D5  07FA  2285        TSTL    (SP)+                    ; Clear stack
       50    01    D0  07FC  2286 40$:   MOVL    #SS$_NORMAL,R0           ; Set for succes
                   05  07FF  2287 50$:   RSB
                       0800  2288
                       0800  2289        .DSABL  LSB
                       0800  2290
                       0800  2291        .END
```

```
ALLOC_BD                          000003BB R     01        CDT$L_MSGRCVD                     = 00000080
BAD_CONID                         00000761 R     01        CDT$L_MSGSENT                     = 0000007C
BAD_SCONID                        00000772 R     01        CDT$L_PB                          = 0000001C
BD_SEQ_ERROR                      00000560 R     01        CDT$L_PDT                         = 00000010
BSY_ERR                           000005A3 R     01        CDT$L_RCONID                      = 00000014
BUG$_CIPORT                       ********     X 01        CDT$L_REQDATS                     = 0000008C
CDL$W_MAXCONIDX                 = FFFFFFF0                 CDT$L_RPROCNAM                    = 00000050
CDRP$B_RMOD                     = FFFFFFAB                 CDT$L_SCSMSG                      = 0000002C
CDRP$L_BCNT                     = FFFFFFD2                 CDT$L_SNDDATS                     = 00000084
CDRP$L_CDT                      = 00000024                 CDT$W_DGREC                       = 0000004C
CDRP$L_FPC                      = 0000000C                 CDT$W_INITLREC                    = 00000048
CDRP$L_FR3                      = 00000010                 CDT$W_MINREC                      = 00000044
CDRP$L_LBOFF                    = 00000030                 CDT$W_PENDREC                     = 00000046
CDRP$L_LBUFH_AD                 = 0000002C                 CDT$W_QBDT_CNT                    = 0000009A
CDRP$L_MSG_BUF                  = 0000001C                 CDT$W_QCR_CNT                     = 00000098
CDRP$L_RBOFF                    = 00000038                 CDT$W_REASON                      = 00000026
CDRP$L_RBUFH_AD                 = 00000034                 CDT$W_REC                         = 00000042
CDRP$L_RSPID                    = 00000020                 CDT$W_SEND                        = 00000040
CDRP$L_RWCPTR                   = 00000028                 CDT$W_STATE                       = 00000028
CDRP$L_SAVD_RTN                 = 00000018                 CHK_CRWAIT                          000006CB R     01
CDRP$L_SVAPTE                   = FFFFFFCC                 CIBD$C_LENGTH                     = 00000010
CDRP$L_XCT_LEN                  = 0000003C                 CIBD$L_BLEN                       = 00000004
CDRP$W_BOFF                     = FFFFFFD0                 CIBD$L_CDRP                       = 0000000C
CDRP$W_STS                      = FFFFFFCA                 CIBD$L_LINK                       = 0000000C
CDT$B_RSTATION                  = 00000020                 CIBD$L_SVAPTE                     = 00000008
CDT$C_ACCP_PEND                 = 00000002                 CIBD$M_AC                         = 00001000
CDT$C_ACCP_SENT                 = 0000000A                 CIBD$M_V                          = 00008000
CDT$C_CLOSED                    = 00000000                 CIBD$V_ACMOD                      = 0000000D
CDT$C_CON_ACK                   = 00000008                 CIBD$V_V                          = 0000000F
CDT$C_CON_PEND                  = 00000001                 CIBD$W_FLAGS                      = 00000000
CDT$C_CON_REC                   = 00000009                 CIBD$W_KEY                        = 00000002
CDT$C_CON_SENT                  = 00000007                 CIBDT$B_SUBTYP                    = FFFFFFF3
CDT$C_CR_PEND                   = 00000005                 CIBDT$B_TYPE                      = FFFFFFF2
CDT$C_DCR_PEND                  = 00000006                 CIBDT$C_BDLIST                    = 00000000
CDT$C_DISC_ACK                  = 00000003                 CIBDT$C_LENGTH                    = 00000018
CDT$C_DISC_MTCH                 = 00000006                 CIBDT$L_FREEBD                    = FFFFFFF4
CDT$C_DISC_PEND                 = 00000004                 CIBDT$L_MAXIDX                    = FFFFFFF8
CDT$C_DISC_REC                  = 00000004                 CIBDT$L_WAITBL                    = FFFFFFEC
CDT$C_DISC_SENT                 = 00000005                 CIBDT$L_WAITFL                    = FFFFFFE8
CDT$C_OPEN                      = 00000002                 CIBDT$W_SIZE                      = FFFFFFF0
CDT$C_REJ_PEND                  = 00000003                 CIBHAN$C_BNAME                    = 00000004
CDT$C_REJ_SENT                  = 0000000B                 CIBHAN$L_BOFF                     = 00000000
CDT$L_BYTMAPD                   = 00000094                 CIBHAN$L_RCONID                   = 00000008
CDT$L_BYTREQD                   = 00000090                 CNF$LKP_PB_MSG                      ********     X 01
CDT$L_BYTSENT                   = 00000088                 CNF$STOP_VCS                        ********     X 01
CDT$L_CDTLST                    = 0000006C                 COMMON_XFER                         000004DF R     01
CDT$L_CRWAITQBL                 = 0000003C                 CON_MEM_FAIL                        00000047 R     01
CDT$L_CRWAITQFL                 = 00000038                 CON_MEM_FAIL1                       00000049 R     01
CDT$L_DGDISCARD                 = 00000078                 DGCOM                               00000624 R     01
CDT$L_DGINPUT                   = 00000004                 DG_ALC_FAIL                         000002E2 R     01
CDT$L_DGRCVD                    = 00000074                 DISC_CON_ACK                        0000011C R     01
CDT$L_DGSENT                    = 00000070                 DISC_DISC_REC                       0000013B R     01
CDT$L_FPC                       = 00000064                 DISC_ILLSTATE                       0000010D R     01
CDT$L_FR5                       = 00000068                 DISC_OPEN                           0000014F R     01
CDT$L_LCONID                    = 00000018                 DQUEUE_DG                           0000031A R     01
CDT$L_LPROCNAM                  = 00000054                 DQ_INCOMPLETE                       00000333 R     01
CDT$L_MSGINPUT                  = 00000000                 DYN$C_CI                          = 00000061
```

```
DYN$C_CI_BDT                    = 00000001                    INT$INS_DFREEQ                    ********     X   01
ERR$BUGCHECK                      ********     X   01         INT$INS_DFREEQX                   ********     X   01
ERR$BUGCHECKNF                    ********     X   01         INT$INS_MFREEQ                    ********     X   01
ERR$CRASHVC                       ********     X   01         INT$MRESET                        ********     X   01
ERR$DEBUGCHECK                    ********     X   01         INT$MSTART                        ********     X   01
ERR$DISC_PWFAIL                   ********     X   01         INT$READCNT                       ********     X   01
ERR$V_DEB_SCERR                   ********     X   01         INT$REQDAT                        ********     X   01
ERR$V_DEB_XCTER                   ********     X   01         INT$SNDDAT                        ********     X   01
EXE$ACONONPAGED                   ********     X   01         INT$SNDDG                         ********     X   01
FPC$ACCEPT                        00000053 RG      01         INT$SNDMSG                        ********     X   01
FPC$ALLOCDG                       000002D4 RG      01         IRP$M_PAGIO                     = 00000004
FPC$ALLOCMSG                      0000015F RG      01         IRP$M_SWAPIO                    = 00000040
FPC$CHK_DCONID                    0000073F RG      01         ISSUE_RDCNT                       0000058F R       01
FPC$CHK_LCONID                    00000739 R       01         MAP_COMMON                        000003B7 R       01
FPC$CHK_SCONID                    00000719 R       01         MEM_ERR                           000005E5 R       01
FPC$CONNECT                       00000006 RG      01         PB$C_PWR_FAIL                   = 00004000
FPC$DCONNECT                      000000CF RG      01         PB$C_VC_FAIL                    = 00008000
FPC$DEALLOCDG                     000002E8 RG      01         PB$L_CDTLST                     = 00000034
FPC$DEALLOMSG                     00000218 RG      01         PB$W_STATE                      = 00000012
FPC$DEALRGMSG                     0000022B RG      01         PDT$C_CNTCDRP                   = 000000D4
FPC$INITIAL                       00000787 RG      01         PDT$L_MSGHDRSZ                  = 000000B4
FPC$MAINTFCN                      00000000 RG      01         PDT$L_WAITQBL                   = 000000B0
FPC$MAP                           000003AE RG      01         PDT$M_CNTBSY                    = 00000001
FPC$MAPBYPASS                     00000395 RG      01         PDT$M_CNTRLS                    = 00000002
FPC$MAPIRP                        0000039E RG      01         PDT$T_CNTOWNER                  = 000000C4
FPC$MAPIRPBYP                     0000038D RG      01         PDT$V_CNTBSY                    = 00000000
FPC$MRESET                        000005C4 RG      01         PDT$V_CNTRLS                    = 00000001
FPC$MSTART                        000005CC RG      01         PDT$W_FLAGS                     = 000000C0
FPC$QUEUEDG                       000002EE RG      01         PORT_ERR                          000005F2 R       01
FPC$QUEUEMDGS                     000002F6 RG      01         QUEUE_DG                          000002FE R       01
FPC$RCHMSGBUF                     000001C3 RG      01         Q_INCOMPLETE                      00000336 R       01
FPC$RCLMSGBUF                     000001CD RG      01         Q_SUCCESS                         00000316 R       01
FPC$READCOUNT                     0000057A RG      01         RD$L_CDRP                       = 00000000
FPC$REC_CNFREC                    00000638 RG      01         RD$W_SEQNUM                     = 00000006
FPC$REC_DATREC                    00000638 RG      01         RD_SEQ_ERR                        0000067A R       01
FPC$REC_DGREC                     000005FF RG      01         SCS$ALL_ALLBUF                    ********     X   01
FPC$REC_MSGREC                    00000699 RG      01         SCS$ALL_ALLBUF2                   ********     X   01
FPC$REC_RDCNT                     000006F9 RG      01         SCS$COPY_ACCP                     ********     X   01
FPC$REC_SNDDG                     0000061B RG      01         SCS$C_APPL_DG                   = 0000000B
FPC$REC_SNDMSG                    000006E6 RG      01         SCS$C_APPL_MSG                  = 0000000A
FPC$REJECT                        000000B6 RG      01         SCS$C_OVHD                      = 0000000E
FPC$REQDATA                       00000453 RG      01         SCS$DEALL_CDT                     ********     X   01
FPC$RLSCOUNT                      000005BB RG      01         SCS$DEALL_RSPID                   ********     X   01
FPC$SENDDATA                      0000049A RG      01         SCS$DEAL_ALLBUF                   ********     X   01
FPC$SENDDG                        0000034C RG      01         SCS$DEAL_SCSREC                   ********     X   01
FPC$SENDMSG                       00000266 RG      01         SCS$DISC_VCFAIL                   ********     X   01
FPC$SENDRGDG                      0000033F RG      01         SCS$GL_BDT                        ********     X   01
FPC$SNDCNTMSG                     0000026D RG      01         SCS$GL_CDL                        ********     X   01
FPC$STOP_VCS                      000005FB RG      01         SCS$GL_RDT                        ********     X   01
FPC$UNMAP                         000005CC RG      01         SCS$GW_BDTCNT                     ********     X   01
FPC_SUCCESS                       000002DE R       01         SCS$GW_FLOWCUSH                   ********     X   01
INT$ALLOC_DG                      ********     X   01         SCS$GW_MAXMSG                     ********     X   01
INT$ALLOC_MSG                     ********     X   01         SCS$L_DST_CONID                 = FFFFFFF8
INT$CRASH_PORT                    ********     X   01         SCS$L_LCONID                    = FFFFFFF0
INT$DEAL_DG                       ********     X   01         SCS$L_REC_BOFF                  = 00000008
INT$DEAL_MSG                      ********     X   01         SCS$L_REC_NAME                  = 00000004
INT$DFQ2POOL                      ********     X   01         SCS$L_RSPID                     = FFFFFFF4
```

```
SCS$L_SND_BOFF                  = 00000000
SCS$L_SND_NAME                  = FFFFFFFC
SCS$L_SRC_CONID                 = FFFFFFFC
SCS$L_XCT_LEN                   = FFFFFFF8
SCS$MAP_VMSSTS                    ********    X     01
SCS$REC_SCSMSG                    ********    X     01
SCS$REQ_SCSSEND                   ********    X     01
SCS$RESUMEWAITR                   ********    X     01
SCS$T_DST_PROC                  = 00000004
SCS$T_SRC_PROC                  = 00000014
SCS$W_CREDIT                    = FFFFFFF6
SCS$W_LENGTH                    = FFFFFFF0
SCS$W_MTYPE                     = FFFFFFF4
SCSSEND                           000000B0 R        01
SC_SEQ_ERR                        000006EE R        01
SS$_ABORT                       = 0000002C
SS$_DGQINCOMP                   = 000009C0
SS$_ILLCDTST                    = 00002154
SS$_ILLIOFUNC                   = 000000F4
SS$_INSFMEM                     = 00000124
SS$_INTERLOCK                   = 0000038C
SS$_NORMAL                      = 00000001
STACE_CDT                         00000698 R        01
STATE_ERR                         00000574 R        01
STATE_ERR_R3                      00000571 R        01
SUSP_CONCALL                      00000568 R        01
SYSAP$C_DGREC                   = 00000000
SYSAP$C_DGSNT                   = 00000001
SYSAP$C_DISPRET                 = 00000001
WAIT_BD                           0000040E R        01

                                                   +----------------+
                                                   ! 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                    00000800  ( 2048.)  01 (  1.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD     WRT NOVEC LONG
$ABS$                            00000000  (     0.)  02 (  2.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD     WRT NOVEC BYTE

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

Phase                       Page faults    CPU Time       Elapsed Time
-----                       -----------    --------       ------------
Initialization                      30     00:00:00.04    00:00:00.97
Command processing                 109     00:00:00.45    00:00:02.57
Pass 1                             431     00:00:11.37    00:00:39.58
Symbol table sort                    0     00:00:01.40    00:00:04.26
Pass 2                             389     00:00:03.68    00:00:16.82
Symbol table output                 10     00:00:00.15    00:00:00.31
Psect synopsis output                0     00:00:00.01    00:00:00.01
Cross-reference output               0     00:00:00.00    00:00:00.00
Assembler run totals               971     00:00:17.10    00:01:04.52
```

```
The working set limit was 2100 pages.
99428 bytes (195 pages) of virtual memory were used to buffer the intermediate code.
There were 80 pages of symbol table space allocated to hold 1336 non-local and 70 local symbols.
2291 source lines were read in Pass 1, producing 23 object records in Pass 2.
39 pages of virtual memory were used to define 37 macros.

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

Macro library name                                Macros defined
------------------                                -----.---------
_$255$DUA28:[DRIVER.OBJ]PALIB.MLB;1                        7
_$255$DUA28:[SYS.OBJ]LIB.MLB;1                            16
_$255$DUA28:[SYSLIB]STARLET.MLB;2                          6
TOTALS (all libraries)                                    29

1486 GETS were required to define 29 macros.

There were no errors, warnings or information messages.

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

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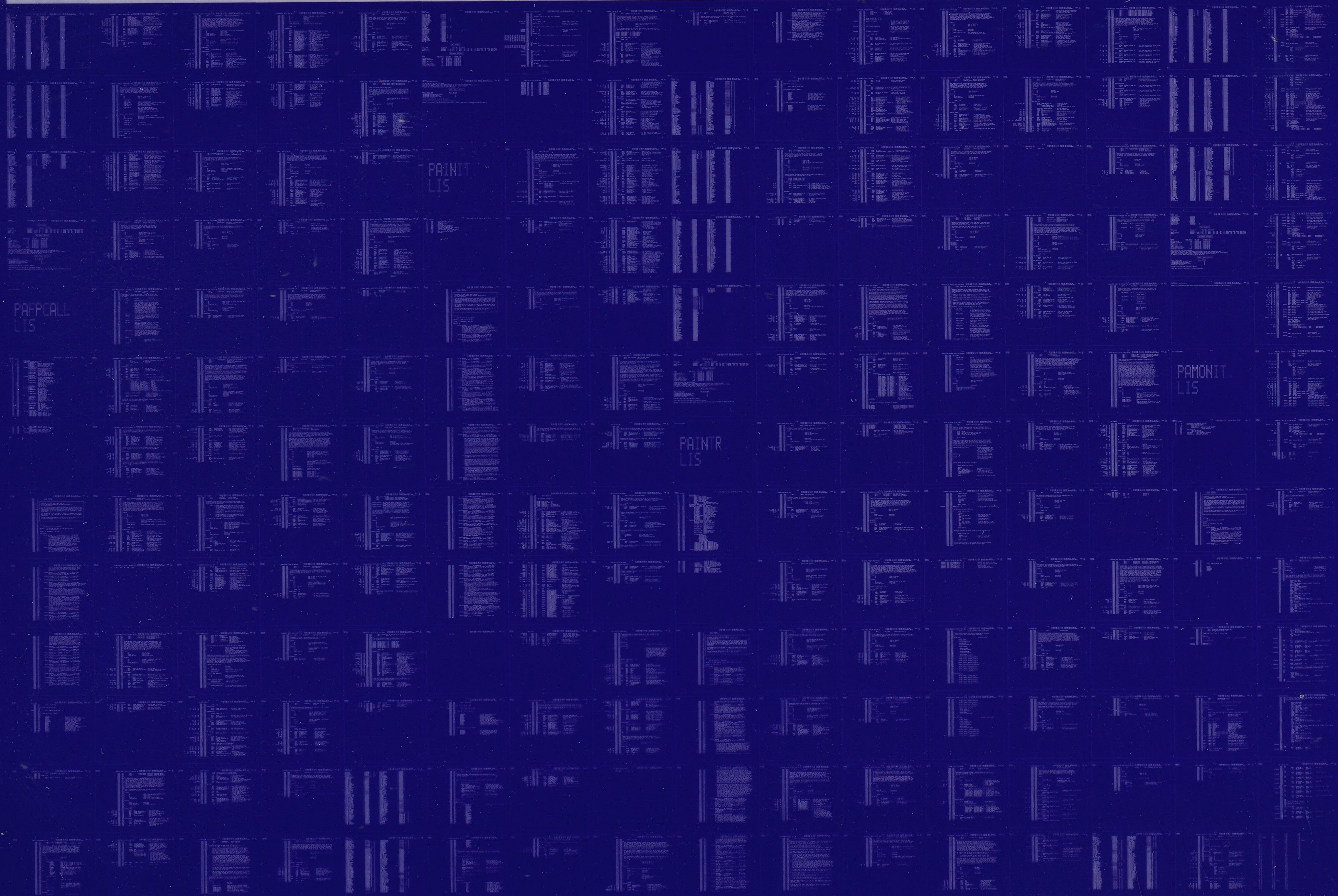

PAINIT
LIS

PAFPCALL
LIS

PAMONIT
LIS

PAINTR
LIS