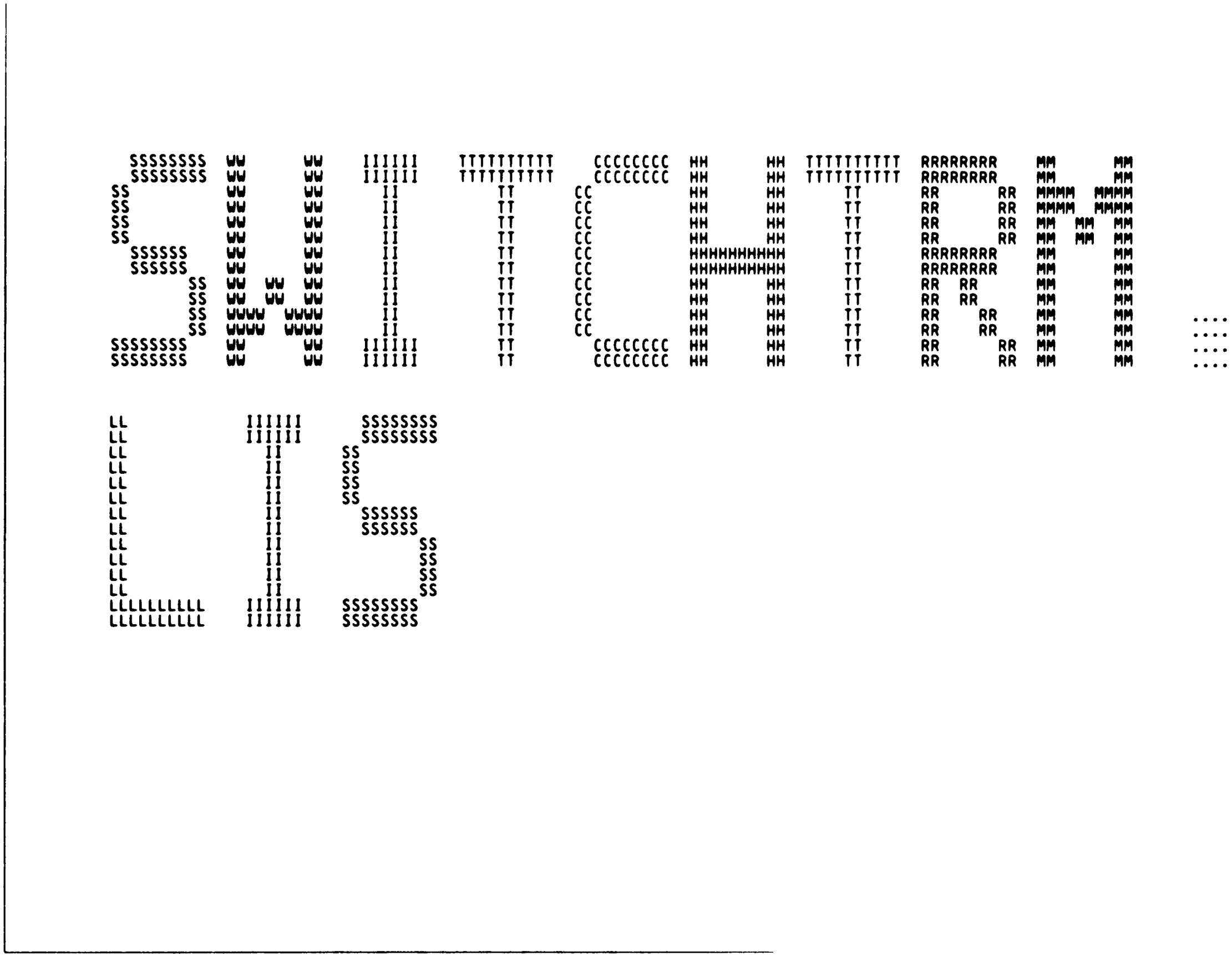
```
   CCCCCCCCCCCC  LLL                  IIIIIIIII     UUU         UUU  TTTTTTTTTTTTTTT  LLL
   CCCCCCCCCCCC  LLL                  IIIIIIIII     UUU         UUU  TTTTTTTTTTTTTTT  LLL
   CCCCCCCCCCCC  LLL                  IIIIIIIII     UUU         UUU  TTTTTTTTTTTTTTT  LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
CCC              LLL                     III        UUU         UUU        TTT        LLL
   CCCCCCCCCCCC  LLLLLLLLLLLLLLL      IIIIIIIII     UUUUUUUUUUUUUUU        TTT        LLLLLLLLLLLLLLL
   CCCCCCCCCCCC  LLLLLLLLLLLLLLL      IIIIIIIII     UUUUUUUUUUUUUUU        TTT        LLLLLLLLLLLLLLL
   CCCCCCCCCCCC  LLLLLLLLLLLLLLL      IIIIIIIII     UUUUUUUUUUUUUUU        TTT        LLLLLLLLLLLLLLL
```

FILEID**SWITCHTRM



```
0000     1          .TITLE  SWITCH TERMINAL - Switch terminal port to or from DECNET
0000     2          .IDENT  /V04-000/
0000     3
0000     4  ;****************************************************************************
0000     5  ;*                                                                          *
0000     6  ;*  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                                 *
0000     7  ;*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                   *
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0000    14  ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY    *
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0000    17  ;*  THE INFORMATION IN THIS SOFTWARE IS  SUBJECT TO CHANGE WITHOUT NOTICE    *
0000    18  ;*  AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT    *
0000    19  ;*  CORPORATION.                                                            *
0000    20  ;*                                                                          *
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0000    22  ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                 *
0000    23  ;*                                                                          *
0000    24  ;*                                                                          *
0000    25  ;****************************************************************************
0000    26
0000    27  ;++
0000    28  ; FACILITY: SET command
0000    29  ;
0000    30  ; ABSTRACT:
0000    31  ;
0000    32  ;       This module supports switching a terminal port from terminal line
0000    33  ;       to asynch DDCMP mode and vice versa.
0000    34  ;
0000    35  ; AUTHOR:
0000    36  ;
0000    37  ;       Meg Dumont 1-Feb-84
0000    38  ;
0000    39  ; MODIFIED BY:
0000    40  ;
0000    41  ;       V03-003 MMD0327         Meg Dumont,     31-Aug-1984  17:45
0000    42  ;               Fix to clear UCB$L_FR4 field when swtiching back to a terminal
0000    43  ;
0000    44  ;       V03-002 MMD0319         Meg Dumont,     25-Jul-1984  15:38
0000    45  ;               Fix to call IOC$VERFIYCHAN before raising our IPL.
0000    46  ;
0000    47  ;       V03-001 TMH0001         Tim Halvorsen           18-Mar-1984
0000    48  ;               Fix to lock down code pages before executing high IPL code.
0000    49  ;--
```

```
                                0000     51
                                0000     52          $ccbdef
                                0000     53          $devdef
                                0000     54          $ddbdef
                                0000     55          $dptdef
                                0000     56          $ipldef
                                0000     57          $jpidef
                                0000     58          $prvdef
                                0000     59          $ssdef
                                0000     60          $ttdef
                                0000     61          $ttyucbdef
                                0000     62          $ttyvecdef
                                0000     63          $ttymodem
                                0000     64          $ucbdef
                                0000     65
                                0000     66
                                0000     67 ; temp
                             00000000    68          .PSECT  SET$RWDATA,NOEXE,LONG
                                0000     69
      52 45 56 49 52 44 4F 4E 00' 0000    70 NODRV_NAME: .ASCIC      /NODRIVER/
                                08  0000
                                0009     71
                             00000000    72          .PSECT  SET$CODE,NOWRT
                                0000     73
                                0000     74 ;++
                                0000     75 ;SWITCH_TO_DDCMP
                                0000     76 ;
                                0000     77 ; This routine does the actual switch. First using the channel assigned
                                0000     78 ; we find out the virtual UCB for this device. Next
                                0000     79 ; we check the reference count in the virtual UCB to ensure it is not
                                0000     80 ; owned by anyone else. It does this by subtracting 1 from the reference
                                0000     81 ; count field. SET TERMINAL has a channel assigned to the device so we can
                                0000     82 ; account for one of the channels. If any other channels are assigned
                                0000     83 ; we can not allow the switch to occur. Please note that if this truly a
                                0000     84 ; virtual UCB (ie. VTA0 variety), the reference count in the UCB will be
                                0000     85 ; greater than one and the switch will fail. We check to see if the
                                0000     86 ; ASYNCH DDCMP CLASS driver, NODRIVER is loaded. Next we
                                0000     87 ; set the appropriate fields in the UCB to point to the NODRIVER.
                                0000     88 ; We also set the NET bit in the DEVCHAR  field to reflect that this
                                0000     89 ; is an asycnh ddmcp line. Finally , we call the port at its
                                0000     90 ; ABORT and RESUME entry points to ensure that there is nothing outstanding
                                0000     91 ; on the line.
                                0000     92 ;
                                0000     93 ;       INPUTS:
                                0000     94 ;               4(ap) = Channel assigned to device
                                0000     95 ;
                                0000     96 ;       OUTPUTS:
                                0000     97 ;               R0 = Status of the switch
                                0000     98 ;                       SS$_NORMAL - Switch was made
                                0000     99 ;                       SS$_IVCHAN - Invalid channel
                                0000    100 ;                       SS$_NOSUCHDEV - NODRIVER was not loaded
                                0000    101 ;                       SS$_DEVALLOC - Device was in use no switch is made
                                0000    102 ;
                                0000    103 ;--
                                0000    104 switch_to_ddcmp::
                           0000 0000    105          .word   0
                         3E    BB 0002    106          pushr   #^m<r1,r2,r3,r4,r5>
```

```
                50    04 AC    D0  0004   107          movl    4(ap),r0                        ; get the channel number
             00000000'GF    16  0008   108          jsb     g^ioc$verifychan                ; Call to get CCB from channel
                            000E   109          setipl  switch_ddcmp_ipl                ; Disable for synch to IODATA BASE
                            0015   110                                                  ; & lock down this code
            50    013C 8F    B1  0015   111          cmpw    #ss$_ivchan,r0                  ; If eql then not proper channel
                     69    13  001A   112          beql    switch_err
                  55   61    D0  001C   113          movl    ccb$l_ucb(r1),r5                ; Get the virtual UCB for device
         51    5C A5   01    A3  001F   114          subw3   #1,ucb$w_refc(r5),r1            ; If NEQ then channels assign
                     65    12  0024   115          bneq    switch_ddcmp_err_inuse          ; do not allow switch
            50    00A0 C5    D0  0026   116          movl    ucb$l_tl_phyucb(r5),r0          ; Get the physical UCB
                     03    13  002B   117          beql    10$                             ; If eql field not setup
                  55   50    D0  002D   118          movl    r0,r5
                            0030   119 10$:       setipl  ucb$b_dipl(r5)                  ; Disable device interrupts
         50    00000000'GF    D0  0034   120          movl    g^no$gl_dpt,r0                  ; Get the address of the Nodriver dp
                     59    13  003B   121          beql    switch_ddcmp_notloaded          ; If eql driver not loaded
                51   1E A0    3C  003D   122          movzwl  dpt$w_vector(r0),r1             ; Get the offset of the class vector
                  50   51    C0  0041   123          addl2   r1,r0                           ; Get the addr of the class vector a
            0114 C5    50    D0  0044   124          movl    r0,ucb$l_tt_class(r5)           ; Set asynch ddcmp vector address
            010C C5    60    D0  0049   125          movl    class_getnxt(r0),ucb$l_tt_getnxt(r5) ; Set Asynch ddcmp getnxt
         0110 C5    04 A0    D0  004E   126          movl    class_putnxt(r0),ucb$l_tt_putnxt(r5) ; Set asynch ddmcp putnxt
         0088 C5    10 A0    D0  0054   127          movl    class_ddt(r0),ucb$l_ddt(r5)     ; Set DDT address
                  00A8 C5    7C  005A   128          clrq    ucb$q_tl_brkthru(r5)            ; Clear class drivers dependant  fie
                51   28 A5    D0  005E   129          movl    ucb$l_ddb(r5),r1                ; Get DDB
                  0C A1    51  D0  0062   130          movl    r1,ddb$l_ddt(r1)                ; Reset the DDT
         38 A5    2000 8F    A8  0066   131          bisw2   #dev$m_net,ucb$l_devchar(r5)    ; Set that this is a network device
            50    0118 C5    D0  006C   132          movl    ucb$l_tt_port(r5),r0            ; Get port vector table
                     20 B0    16  0071   133          jsb     @port_abort(r0)                 ; Call abort to clear line
            50    0118 C5    D0  0074   134          movl    ucb$l_tt_port(r5),r0            ; Get port vector table
                     24 B0    16  0079   135          jsb     @port_resume(r0)                ; Call resume to restart line
                            007C   136          setipl  #0
                     3E    BA  007F   137          popr    #^m<r1,r2,r3,r4,r5>
                  50   01    3C  0081   138          movzwl  #ss$_normal,r0
                            04  0084   139          ret
                            0085   140
                            0085   141 switch_err:
                            0085   142          setipl #0
                     3E    BA  0088   143          popr    #^m<r1,r2,r3,r4,r5>
                            04  008A   144          ret
                            008B   145
                            008B   146 switch_ddcmp_err_inuse:
                            008B   147          setipl  #0
                     3E    BA  008E   148          popr    #^m<r1,r2,r3,r4,r5>
         50    0840 8F    3C  0090   149          movzwl  #ss$_devalloc,r0
                            04  0095   150          ret
                            0096   151
                            0096   152 switch_ddcmp_notloaded:
                            0096   153          setipl  #0
                     3E    BA  0099   154          popr    #^m<r1,r2,r3,r4,r5>
         50    0908 8F    3C  009B   155          movzwl  #ss$_nosuchdev,r0
                            04  00A0   156          ret
                            00A1   157
                            00A1   158 switch_ddcmp_ipl:                                ; Used to fault in code &
                00000008    00A1   159          .long   ipl$_synch                      ; lock down pages simultaneously
                            00A5   160
                            00A5   161 ;++
                            00A5   162 ;SWITCH_TO_TERMINAL
                            00A5   163 ;
```

```
                     00A5   164 ; This routine does the actual switch. First using the channel assigned
                     00A5   165 ; we find out the virtual UCB for this device. Next
                     00A5   166 ; we check the reference count in the virtual UCB to ensure it is not
                     00A5   167 ; owned by anyone else. It does this by subtracting 1 from the reference
                     00A5   168 ; count field. SET TERMINAL has a channel assigned to the device so we can
                     00A5   169 ; account for one of the channels. If any other channels are assigned
                     00A5   170 ; we can not allow the switch to occur. Please note that if this truly a
                     00A5   171 ; virtual UCB (ie. VTA0 variety), the reference count in the UCB will be
                     00A5   172 ; greater than one and the switch will fail. Next we
                     00A5   173 ; set the appropriate fields in the UCB to point to the terminal class
                     00A5   174 ; driver. We clear the NET bit in DEVCHAR to reflect that this
                     00A5   175 ; is once again a terminal. It will also call the port at its ABORT and RESUME
                     00A5   176 ; entry ; points to ensure that there is nothing outstanding on the line. We
                     00A5   177 ; must also ensure that the terminal is put back to normal which means
                     00A5   178 ; calling the terminal class driver at its SETUP_UCB entry point to reset
                     00A5   179 ; the CLASS dependant portion of the UCB, and calling the PORT driver at
                     00A5   180 ; its DS_TRANS entry point to ensure that the modem signals were reset properly.
                     00A5   181 ;
                     00A5   182 ;       INPUTS:
                     00A5   183 ;               4(ap) = Channel asignned to device
                     00A5   184 ;
                     00A5   185 ;       OUTPUTS:
                     00A5   186 ;               R0 = Status of the switch
                     00A5   187 ;                       SS$_NORMAL - Switch was made
                     00A5   188 ;                       SS$_DEVALLOC - Device was in use no switch is made
                     00A5   189 ;
                     00A5   190 ;--
                     00A5   191 switch_to_terminal::
                0000 00A5   192         .word   0
              3E    BB 00A7   193         pushr   #^m<r1,r2,r3,r4,r5>
           50   04 AC   D0 00A9   194         movl    4(ap),r0                ; get the channel number
        00000000'GF   16 00AD   195         jsb     g^ioc$verifychan        ; Call to get CCB from channel
                      00B3   196         setipl  switch_terminal_ipl     ; Disable for synch to IODATA BASE
                      00BA   197                                         ; & lock down this code
       50   013C 8F   B1 00BA   198         cmpw    #ss$_ivchan,r0          ; If eql then not proper channel
              C4   13 00BF   199         beql    switch_err
           55   61   D0 00C1   200         movl    ccb$l_ucb(r1),r5        ; Get the virtual UCB for device
     51    5C A5   01   A3 00C4   201         subw3   #1,ucb$w_refc(r5),r1    ; If EQL then no channels assign
              03   13 00C9   202         beql    5$                      ; allow switch
            0086   31 00CB   203         brw     switch_terminal_err_inuse ; Else do not allow switch
       50   00A0 C5   D0 00CE   204 5$:     movl    ucb$l_tl_phyucb(r5),r0  ; Get the physical UCB
              03   13 00D3   205         beql    10$                     ; If eql field not setup
           55   50   D0 00D5   206         movl    r0,r5
                      00D8   207 10$:     setipl  ucb$b_dipl(r5)          ; Disable device interrupts
   50   00000000'GF   D0 00DC   208         movl    g^tty$gl_dpt,r0         ; Get the address of the TTdriver dp
         51    1E A0   3C 00E3   209         movzwl  dpt$w_vector(r0),r1     ; Get the offset of the class vector
           50   51   C0 00E7   210         addl2   r1,r0                   ; Get the addr of the class vector a
       0114 C5   50   D0 00EA   211         movl    r0,ucb$l_tt_class(r5)   ; Set terminal class vector address
       010C C5   60   D0 00EF   212         movl    class_getnxt(r0),ucb$l_tt_getnxt(r5) ; Set terminal class getnxt
    0110 C5    04 A0   D0 00F4   213         movl    class_putnxt(r0),ucb$l_tt_putnxt(r5) ; Set terminal class putnxt
    0088 C5    10 A0   D0 00FA   214         movl    class_ddt(r0),ucb$l_ddt(r5) ; Set DDT address
            00A8 C5   7C 0100   215         clrq    ucb$q_tl_brkthru(r5)    ; Clear class drivers dependant  fie
              14 A5   D4 0104   216         clrl    ucb$l_fr4(r5)           ; Clear FR4 because the class port
                      0107   217                                         ; interface uses this for fork info
           51   28 A5   D0 0107   218         movl    ucb$l_ddb(r5),r1        ; Get DDB
           0C A1   51   D0 010B   219         movl    r1,ddb$l_ddt(r1)        ; Reset the DDT
     38 A5    2000 8F   AA 010F   220         bicw2   #dev$m_net,ucb$l_devchar(r5) ; Clear no longer a network device
```

```
                42 A5    00F1 C5    B0  0115   221          movw    ucb$w_tt_desize(r5),ucb$w_devbufsiz(r5) ; Reset page size
                   50    0118 C5    D0  0118   222          movl    ucb$l_tt_port(r5),r0                    ; Get port vector table
                         20 B0    16  0120   223          jsb     @port_abort(r0)                         ; Call abort to clear line
                   50    0118 C5    D0  0123   224          movl    ucb$l_tt_port(r5),r0                    ; Get port vector table
                         24 B0    16  0128   225          jsb     @port_resume(r0)                        ; Call resume to restart line
                   50    0114 C5    D0  012B   226          movl    ucb$l_tt_class(r5),r0                   ; Get the class vector table
                         08 B0    16  0130   227          jsb     @class_setup_ucb(r0)                    ; Reset the ucb for terminal driver
                   50    0118 C5    D0  0133   228          movl    ucb$l_tt_port(r5),r0                    ; Get port vector table
                         08 B0    16  0138   229          jsb     @port_set_line(r0)                      ; Call resume to restart line
                08 44 A5    15    E1  013B   230          bbc     #tt$v_modem,ucb$l_devdepend(r5),20$
                   51    00    9A  0140   231          movzbl  #modem$c_init,r1
                   50    0114 C5    D0  0143   232          movl    ucb$l_tt_class(r5),r0                   ; Get the class vector table
                         0C B0    16  0148   233          jsb     @class_ds_tran(r0)                      ; Reset the modem control
                                      014B   234 20$:     setipl  #0
                         3E    BA    014E   235          popr    #^m<r1,r2,r3,r4,r5>
                   50    01    3C    0150   236          movzwl  #ss$_normal,r0
                               04    0153   237          ret
                                      0154   238
                                      0154   239 switch_terminal_err_inuse:
                                      0154   240          setipl  #0
                         3E    BA    0157   241          popr    #^m<r1,r2,r3,r4,r5>
                   50    0840 8F    3C    0159   242          movzwl  #ss$_devalloc,r0
                               04    015E   243          ret
                                      015F   244
                                      015F   245 switch_terminal_ipl:                                    ; Used to fault in code &
                         00000008     015F   246          .long   ipl$_synch                          ; lock down pages simultaneously
                                      0163   247
                                      0163   248          .END
```

```
CCB$L_UCB                       = 00000000
CLASS_DDT                       = 00000010
CLASS_DS_TRAN                   = 0000000C
CLASS_GETNXT                    = 00000000
CLASS_PUTNXT                    = 00000004
CLASS_SETUP_UCB                 = 00000008
DDB$L_DDT                       = 0000000C
DEV$M_NET                       = 00002000
DPT$W_VECTOR                    = 0001E
IOC$VERIFYCHAN                    ** *****    X   03
IPL$_SYNCH                      = 00000008
MODEM$C_INIT                    = 00000000
NO$GL_DPT                         ********    X   03
NODRV_NAME                        00000000 R      02
PORT_ABORT                      = 00000020
PORT_RESUME                     = 00000024
PORT_SET_LINE                   = 00000008
PR$_IPL                           ********    X   03
SS$_DEVALLOC                    = 00000840
SS$_IVCHAN                      = 0000013C
SS$_NORMAL                      = 00000001
SS$_NOSUCHDEV                   = 00000908
SWITCH_DDCMP_ERR_INUSE            0000008B R      03
SWITCH_DDCMP_IPL                  000000A1 R      03
SWITCH_DDCMP_NOTLOADED            00000096 R      03
SWITCH_ERR                        00000085 R      03
SWITCH_TERMINAL_ERR_INUSE         00000154 R      03
SWITCH_TERMINAL_IPL               0000015F R      03
SWITCH_TO_DDCMP                   00000000 RG     03
SWITCH_TO_TERMINAL                000000A5 RG     03
TT$V_MODEM                      = 00000015
TTY$GL_DPT                        ********    X   03
UCB$B_DIPL                      = 0000005E
UCB$L_DDB                       = 00000028
UCB$L_DDT                       = 00000088
UCB$L_DEVCHAR                   = 00000038
UCB$L_DEVDEPEND                 = 00000044
UCB$L_FR4                       = 00000014
UCB$L_TL_PHYUCB                 = 000000A0
UCB$L_TT_CLASS                  = 00000114
UCB$L_TT_GETNXT                 = 0000010C
UCB$L_TT_PORT                   = 00000118
UCB$L_TT_PUTNXT                 = 00000110
UCB$Q_TL_BRKTHRU                = 000000A8
UCB$W_DEVBUFSIZ                 = 00000042
UCB$W_REFC                      = 0000005C
UCB$W_TT_DESIZE                 = 000000F1
```

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

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	00000000 (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
SET$RWDATA	00000009 (9.)	02 (2.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG

```
SET$CODE                        00000163  (  355.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD  NOWRT NOVEC BYTE
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	11	00:00:00.09	00:00:00.71
Command processing	81	00:00:00.89	00:00:05.57
Pass 1	403	00:00:14.38	00:00:44.52
Symbol table sort	0	00:00:02.50	00:00:08.61
Pass 2	74	00:00:02.28	00:00:08.97
Symbol table output	7	00:00:00.09	00:00:00.09
Psect synopsis output	2	00:00:00.03	00:00:00.03
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	581	00:00:20.26	00:01:08.50

```
The working set limit was 1350 pages.
81109 bytes (159 pages) of virtual memory were used to buffer the intermediate code.
There were 90 pages of symbol table space allocated to hold 1633 non-local and 4 local symbols.
248 source lines were read in Pass 1, producing 16 object records in Pass 2.
23 pages of virtual memory were used to define 22 macros.
```

Macro library statistics

Macro library name	Macros defined
_255DUA28:[CLIUTL.OBJ]CLIUTL.MLB;1	0
_255DUA28:[SYS.OBJ]LIB.MLB;1	10
_255DUA28:[SYSLIB]STARLET.MLB;2	8
TOTALS (all libraries)	18

```
1744 GETS were required to define 18 macros.

There were no errors, warnings or information messages.

MACRO/LIS=LIS$:SWITCHTRM/OBJ=OBJ$:SWITCHTRM MSRC$:SWITCHTRM/UPDATE=(ENH$:SWITCHTRM)+EXECML$/LIB+LIB$:CLIUTL/LIB
```

0059 AH-BT13A-SE
VAX/VMS V4.0

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TERMDEFS
LIS

SUBMITMSG
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TRANQUEUE
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SWITCHTRM
LIS

SUBMIT
LIS