```
NNN        NNN   CCCCCCCCCCCC   PPPPPPPPPPPP
NNN        NNN   CCCCCCCCCCCC   PPPPPPPPPPPP
NNN        NNN   CCCCCCCCCCCC   PPPPPPPPPPPP
NNN        NNN   CCC              PPP           PPP
NNN        NNN   CCC              PPP           PPP
NNN        NNN   CCC              PPP           PPP
NNNNNN     NNN   CCC              PPP           PPP
NNNNNN     NNN   CCC              PPP           PPP
NNNNNN     NNN   CCC              PPP           PPP
NNN   NNN  NNN   CCC              PPPPPPPPPPPP
NNN   NNN  NNN   CCC              PPPPPPPPPPPP
NNN   NNN  NNN   CCC              PPPPPPPPPPPP
NNN     NNNNNN   CCC              PPP
NNN     NNNNNN   CCC              PPP
NNN     NNNNNN   CCC              PPP
NNN        NNN   CCC              PPP
NNN        NNN   CCC              PPP
NNN        NNN   CCC              PPP
NNN        NNN   CCCCCCCCCCCC     PPP
NNN        NNN   CCCCCCCCCCCC     PPP
NNN        NNN   CCCCCCCCCCCC     PPP
```

FILEID**NCPTERMIO

```
NN      NN   CCCCCCC   PPPPPPPP   TTTTTTTTTT  EEEEEEEEEE  RRRRRRR    MM      MM   IIIIII   000000
NN      NN  CCCCCCCC   PPPPPPPP   TTTTTTTTTT  EEEEEEEEEE  RRRRRRRR   MM      MM   IIIIII   000000
NN      NN  CC         PP      PP      TT     EE          RR     RR  MMMM  MMMM       II   00      00
NN      NN  CC         PP      PP      TT     EE          RR     RR  MMMM  MMMM       II   00      00
NNNN    NN  CC         PP      PP      TT     EE          RR     RR  MM  MM  MM       II   00      00
NNNN    NN  CC         PP      PP      TT     EE          RR     RR  MM  MM  MM       II   00      00
NN  NN  NN  CC         PPPPPPPP       TT     EEEEEEEE    RRRRRRR     MM      MM       II   00      00
NN  NN  NN  CC         PPPPPPPP       TT     EEEEEEEE    RRRRRRR     MM      MM       II   00      00
NN    NNNN  CC         PP             TT     EE          RR  RR      MM      MM       II   00      00
NN    NNNN  CC         PP             TT     EE          RR   RR     MM      MM       II   00      00
NN      NN  CC         PP             TT     EE          RR    RR    MM      MM       II   00      00
NN      NN  CC         PP             TT     EE          RR    RR    MM      MM       II   00      00
NN      NN   CCCCCCC   PP             TT     EEEEEEEEEE  RR     RR   MM      MM   IIIIII   000000
NN      NN   CCCCCCC   PP             TT     EEEEEEEEEE  RR     RR   MM      MM   IIIIII   000000
```

```
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    SSSSSSS
```

```
   1   0001  0 %TITLE  'Terminal I/O'
   2   0002  0 MODULE NCPTERMIO (IDENT = 'V04-000'
   3   0003  0                   ADDRESSING_MODE(EXTERNAL=GENERAL),
   4   0004  0                   ADDRESSING_MODE(NONEXTERNAL=GENERAL)) =
   5   0005  1 BEGIN
   6   0006  1
   7   0007  1 !
   8   0008  1 !*********************************************************************
   9   0009  1 !*                                                                   *
  10   0010  1 !*   COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                         *
  11   0011  1 !*   DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.          *
  12   0012  1 !*   ALL RIGHTS RESERVED.                                            *
  13   0013  1 !*                                                                   *
  14   0014  1 !*   THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED *
  15   0015  1 !*   ONLY IN  ACCORDANCE WITH  THE  TERMS  OF  SUCH  LICENSE  AND WITH THE *
  16   0016  1 !*   INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR  ANY  OTHER *
  17   0017  1 !*   COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY *
  18   0018  1 !*   OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY *
  19   0019  1 !*   TRANSFERRED.                                                    *
  20   0020  1 !*                                                                   *
  21   0021  1 !*   THE INFORMATION IN THIS SOFTWARE IS  SUBJECT TO CHANGE WITHOUT NOTICE *
  22   0022  1 !*   AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT *
  23   0023  1 !*   CORPORATION.                                                    *
  24   0024  1 !*                                                                   *
  25   0025  1 !*   DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS *
  26   0026  1 !*   SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.         *
  27   0027  1 !*                                                                   *
  28   0028  1 !*                                                                   *
  29   0029  1 !*********************************************************************
  30   0030  1 !
  31   0031  1
  32   0032  1 !++
  33   0033  1 ! FACILITY:     NCP Network Control Program
  34   0034  1 !
  35   0035  1 ! ABSTRACT:
  36   0036  1 !
  37   0037  1 !       NCP Terminal I/O Data and Routines
  38   0038  1 !
  39   0039  1 ! ENVIRONMENT:  VAX/VMS Operating System
  40   0040  1 !
  41   0041  1 ! AUTHOR:       Darrell Duffy   , CREATION DATE: 17-August-1979
  42   0042  1 !
  43   0043  1 ! MODIFIED BY:
  44   0044  1 !
  45   0045  1 !       V03-002 PRD0056         Paul R. DeStefano       05-Feb-1984
  46   0046  1 !               Verify no longer needed in NCP$READ_LINE routine now
  47   0047  1 !               that it's done by DCL.
  48   0048  1 !
  49   0049  1 !       V03-001 RPG0001         Bob Grosso              22-Feb-1983
  50   0050  1 !               Stop upcasing anything in the command line which has
  51   0051  1 !               been quoted.
  52   0052  1 !
  53   0053  1 !       V001    TMH0001         Tim Halvorsen   28-Jul-1981
  54   0054  1 !               Add general addressing.
  55   0055  1 !--
```

```
  57      0056  1 %SBTTL  'Definitions'
  58      0057  1
  59      0058  1 !
  60      0059  1 ! TABLE OF CONTENTS:
  61      0060  1 !
  62      0061  1
  63      0062  1 FORWARD ROUTINE
  64      0063  1
  65      0064  1         NCP$READ_LINE,              ! Read a line of sysinput
  66      0065  1         NCP$WRITE_LINE              ! Write a line to sysoutput
  67      0066  1         ;                    !
  68      0067  1
  69      0068  1 !
  70      0069  1 ! INCLUDE FILES:
  71      0070  1 !
  72      0071  1
  73      0072  1 LIBRARY 'OBJ$:NCPLIBRY.L32';
  74      0073  1 LIBRARY 'SYS$LIBRARY:STARLET.L32';
  75      0074  1
  76      0075  1 !
  77      0076  1 ! MACROS:
  78      0077  1 !
  79      0078  1
  80      0079  1 !
  81      0080  1 ! EQUATED SYMBOLS:
  82      0081  1 !
  83      0082  1
  84      0083  1
  85      0084  1 !
  86      0085  1 ! OWN STORAGE:
  87      0086  1 !
  88      0087  1
  89      0088  1
  90      0089  1 !
  91      0090  1 ! FABs and RABs for RMS I/O
  92      0091  1 !
  93      0092  1
  94      0093  1 OWN
  95    P 0094  1         SYSINFAB:$FAB(
  96    P 0095  1                 FAC = (GET,PUT),
  97    P 0096  1                 FNM = 'SYS$INPUT'
  98      0097  1                 ),
  99    P 0098  1         SYSINRAB:$RAB(
 100    P 0099  1                 RAC = SEQ,
 101    P 0100  1                 ROP = (PMT),
 102    P 0101  1                 FAB = SYSINFAB
 103      0102  1                 ),
 104    P 0103  1         SYSOUTFAB:$FAB(
 105    P 0104  '                 RAT = (CR),
 106    P 0105  1                 FAC = PUT,
 107    P 0106  1                 FNM = 'SYS$OUTPUT'
 108      0107  1                 ),
 109    P 0108  1         SYSOUTRAB:$RAB(
 110    P 0109  1                 RAC = SEQ,
 111    P 0110  1                 FAB = SYSOUTFAB
 112      0111  1                 )
 113      0112  1                 ;
```

```
  114      0113  1
  115      0114  1 |
  116      0115  1 |  EXTERNAL REFERENCES:
  117      0116  1 |
  118      0117  1
```

```
  120   0118  1  %SBTTL  'NCP$INIT_TRMIO  Initialize Terminal I/O'
  121   0119  1  GLOBAL ROUTINE NCP$INIT_TRMIO = !
  122   0120  1
  123   0121  1  !++
  124   0122  1  ! FUNCTIONAL DESCRIPTION:
  125   0123  1  !
  126   0124  1  !       Open and connect terminal input and output files
  127   0125  1  !
  128   0126  1  ! FORMAL PARAMETERS:
  129   0127  1  !
  130   0128  1  !       NONE
  131   0129  1  !
  132   0130  1  ! IMPLICIT INPUTS:
  133   0131  1  !
  134   0132  1  !       NONE
  135   0133  1  !
  136   0134  1  ! IMPLICIT OUTPUTS:
  137   0135  1  !
  138   0136  1  !       NONE
  139   0137  1  !
  140   0138  1  ! ROUTINE VALUE:
  141   0139  1  ! COMPLETION CODES:
  142   0140  1  !
  143   0141  1  !       RMS return if something failed
  144   0142  1  !
  145   0143  1  ! SIDE EFFECTS:
  146   0144  1  !
  147   0145  1  !       SYSINRAB and SYSOUTRAB Open
  148   0146  1  !
  149   0147  1  !--
  150   0148  1
  151   0149  2      BEGIN
  152   0150  2
  153   0151  2      $OPEN (FAB=SYSINFAB);          ! Open and connect input
  154   0152  2      $OPEN (FAB=SYSOUTFAB);         ! and output files
  155   0153  2      $CONNECT (RAB=SYSINRAB);
  156   0154  3      $CONNECT (RAB=SYSOUTRAB)
  157   0155  3
  158   0156  1      END;
```

```
                                              .TITLE   NCPTERMIO Terminal I/O
                                              .IDENT   \V04-000\

                                              .PSECT   $PLIT$,NOWRT,NOEXE,2

        54 55 50 4E 49 24 53 59 53  00000 P.AAA:  .ASCII  \SYS$INPUT\
     54 55 50 54 55 4F 24 53 59 53  00009 P.AAB:  .ASCII  \SYS$OUTPUT\

                                              .PSECT   $OWN$,NOEXE,2

                            03  00000 SYSINFAB:
                                              .BYTE   3
                            50  00001         .BYTE   80
                          0000  00002         .WORD   0
                      00000000  00004         .LONG   0
                      00000000  00008         .LONG   0
```

```
00000000  0000C           .LONG    0
00000000  00010           .LONG    0
    0000  00014           .WORD    0
      03  00016           .BYTE    3
      00  00017           .BYTE    0
00000000  00018           .LONG    0
      00  0001C           .BYTE    0
      00  0001D           .BYTE    0
      00  0001E           .BYTE    0
      02  0001F           .BYTE    2
00000000  00020           .LONG    0
00000000  00024           .LONG    0
00000000  00028           .LONG    0
00000000' 0002C           .ADDRESS P.AAA
00000000  00030           .LONG    0
      09  00034           .BYTE    9
      00  00035           .BYTE    0
    0000  00036           .WORD    0
00000000  00038           .LONG    0
    0000  0003C           .WORD    0
      00  0003E           .BYTE    0
      00  0003F           .BYTE    0
00000000  00040           .LONG    0
00000000  00044           .LONG    0
    0000  00048           .WORD    0
      00  0004A           .BYTE    0
      00  0004B           .BYTE    0
00000000  0004C           .LONG    0
      01  00050 SYSINRAB:
                          .BYTE    1
      44  00051           .BYTE    68
    0000  00052           .WORD    0
40000000  00054           .LONG    1073741824
00000000  00058           .LONG    0
00000000  0005C           .LONG    0
   0000# 00060           .WORD    0[3]
    0000  00066           .WORD    0
00000000  00068           .LONG    0
    0000  0006C           .WORD    0
      00  0006E           .BYTE    0
      00  0006F           .BYTE    0
    0000  00070           .WORD    0
    0000  00072           .WORD    0
00000000  00074           .LONG    0
00000000  00078           .LONG    0
00000000  0007C           .LONG    0
00000000  00080           .LONG    0
      00  00084           .BYTE    C
      00  00085           .BYTE    0
      00  00086           .BYTE    0
      00  00087           .BYTE    0
00000000' 00088           .LONG    0
00000000' 0008C           .ADDRESS SYSINFAB
00000000  00090           .LONG    0
      03  00094 SYSOUTFAB:
                          .BYTE    3
      50  00095           .BYTE    80
```

```
                 0000    00096          .WORD    0
             00000000    00098          .LONG    0
             00000000    0009C          .LONG    0
             00000000    000A0          .LONG    0
             00000000    000A4          .LONG    0
                 0000    000A8          .WORD    0
                   01    000AA          .BYTE    1
                   00    000AB          .BYTE    0
             00000000    000AC          .LONG    0
                   00    000B0          .BYTE    0
                   00    000B1          .BYTE    0
                   02    000B2          .BYTE    2
                   02    000B3          .BYTE    2
             00000000    000B4          .LONG    0
             00000000    000B8          .LONG    0
             00000000    000BC          .LONG    0
            00000000'    000C0          .ADDRESS P.AAB
             00000000    000C4          .LONG    0
                   0A    000C8          .BYTE    10
                   60    000C9          .BYTE    0
                 0000    000CA          .WORD    0
             00000000    000CC          .LONG    0
                 0000    000D0          .WORD    0
                   00    000D2          .BYTE    0
                   00    000D3          .BYTE    0
             00000000    000D4          .LONG    0
             00000000    000D8          .LONG    0
                 0000    000DC          .WORD    0
                   00    000DE          .BYTE    0
                   00    000DF          .BYTE    0
             00000000    000E0          .LONG    0
                   01    000E4 SYSOUTRAB:
                                        .BYTE    1
                   44    000E5          .BYTE    68
                 0000    000E6          .WORD    0
             00000000    000E8          .LONG    0
             00000000    000EC          .LONG    0
             00000000    000F0          .LONG    0
               0000#     000F4          .WORD    0[3]
                 0000    000FA          .WORD    0
             00000000    000FC          .LONG    0
                 0000    00100          .WORD    0
                   00    00102          .BYTE    0
                   00    00103          .BYTE    0
                 0000    00104          .WORD    0
                 0000    00106          .WORD    0
             00000000    00108          .LONG    0
             00000000    0010C          .LONG    0
             00000000    00110          .LONG    0
             00000000    00114          .LONG    0
                   00    00118          .BYTE    0
                   00    00119          .BYTE    0
                   00    0011A          .BYTE    0
                   00    0011B          .BYTE    0
             00000000    0011C          .LONG    0
            00000000'    00120          .ADDRESS SYSOUTFAB
             00000000    00124          .LONG    0
```

```
                                                        .EXTRN   SYS$OPEN, SYS$CONNECT

                                                        .PSECT   $CODE$,NOWRT,2

                                    001C 00000          .ENTRY   NCP$INIT_TRMIO, Save R2,R3,R4        ; 0119
              54 00000000G    00  9E 00002              MOVAB    SYS$CONNECT, R4
              53 00000000G    00  9E 00009              MOVAB    SYS$OPEN, R3
              52 00000000'    00  9E 00010              MOVAB    SYSINFAB, R2
                             52  DD 00017               PUSHL    R2                                  ; 0151
              63              01  FB 00019               CALLS    #1, SYS$OPEN
                    0094      C2  9F 0001C              PUSHAB   SYSOUTFAB                            ; 0152
              63              01  FB 00020               CALLS    #1, SYS$OPEN
                      50      A2  9F 00023              PUSHAB   SYSINRAB                             ; 0153
              64              01  FB 00026               CALLS    #1, SYS$CONNECT
                    00E4      C2  9F 00029              PUSHAB   SYSOUTRAB                            ; 0154
              64              01  FB 0002D               CALLS    #1, SYS$CONNECT
                             04 00030                   RET                                          ; 0156
```

; Routine Size: 49 bytes,   Routine Base: $CODE$ + 0000

```
 160      0157   1  %SBTTL  'NCP$READ_LINE  Read a line from SYS$INPUT'
 161      0158   1  GLOBAL ROUTINE NCP$READ_LINE (INP_DSC, PMT_DSC, RTN_DSC) =        !
 162      0159   1
 163      0160   1  !++
 164      0161   1  !  FUNCTIONAL DESCRIPTION:
 165      0162   1  !
 166      0163   1  !        Read a line from sys$input and return it in a line buffer.
 167      0164   1  !
 168      0165   1  !  FORMAL PARAMETERS:
 169      0166   1  !
 170      0167   1  !        INP_DSC            Address of descriptor of the line buffer
 171      0168   1  !        PMT_DSC            Address of descriptor of prompt string
 172      0169   1  !        RTN_DSC            Address of the descriptor for returned line
 173      0170   1  !
 174      0171   1  !  IMPLICIT INPUTS:
 175      0172   1  !
 176      0173   1  !        SYSINRAB                   File open and connected
 177      0174   1  !
 178      0175   1  !  IMPLICIT OUTPUTS:
 179      0176   1  !
 180      0177   1  !        NONE
 181      0178   1  !
 182      0179   1  !  ROUTINE VALUE:
 183      0180   1  !  COMPLETION CODES:
 184      0181   1  !
 185      0182   1  !        RMS status from $GET
 186      0183   1  !
 187      0184   1  !  SIDE EFFECTS:
 188      0185   1  !
 189      0186   1  !        NONE
 190      0187   1  !
 191      0188   1  !--
 192      0189   1
 193      0190   2      BEGIN
 194      0191   2
 195      0192   2      MAP
 196      0193   2          INP_DSC: REF VECTOR [2],         ! Input line buffer dsc
 197      0194   2          RTN_DSC: REF VECTOR [2],         ! Returned line dsc
 198      0195   2          PMT_DSC: REF VECTOR [2]          ! Prompt string descriptor
 199      0196   2          ;                    !
 200      0197   2
 201      0198   2      LOCAL
 202      0199   2          CHAR,                            ! Char temporary
 203      0200   2          QUOTE_ON,                        ! Record beginning of quoted string in input line
 204      0201   2          STATUS                           ! Hold status from $GET
 205      0202   2          ;
 206      0203   2
 207      0204   2      SYSINRAB [RAB$B_PSZ] = .PMT_DSC [0];! Prompt size
 208      0205   2      SYSINRAB [RAB$L_PBF] = .PMT_DSC [1];! Prompt address
 209      0206   2
 210      0207   2      SYSINRAB [RAB$L_UBF] = .INP_DSC [1];! Setup buffer in rab
 211      0208   2      SYSINRAB [RAB$W_USZ] = .INP_DSC [0];
 212      0209   2
 213      0210   2      IF                                   ! Obtain line and hold status
 214      0211   3          NOT (STATUS = $GET (RAB = SYSINRAB))
 215      0212   2      THEN    RETURN .STATUS               ! if an error occurred
 216      0213   2          ;
```

```
  217    0214  2
  218    0215  2
  219    0216  2  !   Convert the characters to upper case
  220    0217  2  !
  221    0218  2
  222    0219  2      QUOTE_ON = FALSE;
  223    0220  2      INCRA DEX FROM .SYSINRAB [RAB$L_RBF] ! Limits of the input buffer
  224    0221  2                   TO .SYSINRAB [RAB$L_RBF] +
  225    0222  2                      .SYSINRAB [RAB$W_RSZ]
  226    0223  2      DO
  227    0224  3          BEGIN
  228    0225  3          CHAR = CH$RCHAR (CH$PTR (.DEX) );        ! Fetch a character
  229    0226  3
  230    0227  3          IF .CHAR EQLU '"'                        ! Check for quote and toggle flag
  231    0228         THEN QUOTE_ON = NOT .QUOTE_ON;
  232    0229  3
  233    0230  3          IF NOT .QUOTE_ON
  234    0231  3          THEN
  235    0232  3              IF   .CHAR GEQU 'a'                  ! Check for lower case
  236    0233  3                   AND .CHAR LEQU 'z'
  237    0234  3              THEN
  238    0235  3                  CHAR = .CHAR - ('a' - 'A');      ! Reduce to upper case
  239    0236  3          CH$WCHAR (.CHAR, CH$PTR (.DEX) )         ! Write the character back
  240    0237  2          END;
  241    0238  2
  242    0239  2                                                  ! Return the line descriptor
  243    0240  2      RTN_DSC [0] = .SYSINRAB [RAB$W_RSZ];
  244    0241  2      RTN_DSC [1] = .SYSINRAB [RAB$L_RBF];
  245    0242  2
  246    0243  2          RETURN .STATUS                          ! And the RMS status from $GET
  247    0244  1      END;
```

```
                                                        .EXTRN   SYS$GET

                              00FC 00000            .ENTRY   NCP$READ_LINE, Save R2,R3,R4,R5,R6,R7        ; 0158
              57 00000000'   00 9E 00002            MOVAB    SYSINRAB+52, R7
              50        08   AC D0 00009            MOVL     PMT_DSC, R0                                  ; 0204
              67             60 90 0000D            MOVB     (R0), SYSINRAB+52
       FC     A7   04   A0 D0 00010            MOVL     4(R0), SYSINRAB+48                                ; 0205
              50   04   AC D0 00015            MOVL     INP_DSC, R0                                       ; 0207
       F0     A7   04   A0 D0 00019            MOVL     4(R0), SYSINRAB+36
       EC     A7             60 B0 0001E            MOVW     (R0), SYSINRAB+32                            ; 0208
                        CC   A7 9F 00022            PUSHAB   SYSINRAB                                     ; 0211
       00000000G   00   01 FB 00025            CALLS    #1, SYS$GET
              49             50 E9 0002C            BLBC     STATUS, 5$
              56             D4 0002F            CLRL     QUOTE_ON
              55        F4   A7 D0 00031            MOVL     SYSINRAB+40, R5                              ; 0219
              53        EE   A7 3C 00035            MOVZWL   SYSINRAB+34, R3                              ; 0220
         54   55        53   C1 00039            ADDL3    R3, R5, R4                                      ; 0222
              51             55 D0 0003D            MOVL     R5, DEX                                      ; 0220
              26             11 00040            BRB      4$
              52             61 9A 00042  1$:    MOVZBL   (DEX), CHAR                                     ; 0225
              22             52 D1 00045            CMPL     CHAR, #34                                    ; 0227
              03             12 00048            BNEQ     2$
              56             56 D2 0004A            MCOML    QUOTE_ON, QUOTE_ON                           ; 0228
```

```
                            15              56 E8 0004D 2$:   BLBS    QUOTE_ON, 3$                    ; 0230
                  00000061  8F              52 D1 00050       CMPL    CHAR, #97                       ; 0232
                                            0C 1F 00057       BLSSU   3$
                  0000007A  8F              52 D1 00059       CMPL    CHAR, #122                      ; 0233
                                            03 1A 00060       BGTRU   3$
                            52              20 C2 00062       SUBL2   #32, CHAR                       ; 0235
                            81              52 90 00065 3$:   MOVB    CHAR, (DEX)+                    ; 0236
                            54              51 D1 00068 4$:   CMPL    DEX, R4                         ; 0220
                                            D5 1B 0006B       BLEQU   1$
                            51        0C    AC D0 0006D       MOVL    RTN_DSC, R1                     ; 0240
                            61              53 D0 00071       MOVL    R3, (R1)
                  04        A1              55 D0 00074       MOVL    R5, 4(R1)                       ; 0241
                                            04 00078 5$:      RET                                     ; 0244
```

; Routine Size: 121 bytes,   Routine Base: $CODE$ + 0031

```
  249    0245  1  %SBTTL  'NCP$WRITE_LINE  Write a line to SYS$OUTPUT'
  250    0246  1  GLOBAL ROUTINE NCP$WRITE_LINE (LINE_DSC) =
  251    0247  1
  252    0248  1  !++
  253    0249  1  ! FUNCTIONAL DESCRIPTION:
  254    0250  1  !
  255    0251  1  !        Write a line of data to SYS$OUTPUT
  256    0252  1  !
  257    0253  1  ! FORMAL PARAMETERS:
  258    0254  1  !
  259    0255  1  !        LINE_DSC          Address of line descriptor
  260    0256  1  !
  261    0257  1  ! IMPLICIT INPUTS:
  262    0258  1  !
  263    0259  1  !        SYSOUTRAB         Output file RAB, Open for output
  264    0260  1  !
  265    0261  1  ! IMPLICIT OUTPUTS:
  266    0262  1  !
  267    0263  1  !        NONE
  268    0264  1  !
  269    0265  1  ! ROUTINE VALUE:
  270    0266  1  ! COMPLETION CODES:
  271    0267  1  !
  272    0268  1  !        RMS status from $PUT
  273    0269  1  !
  274    0270  1  ! SIDE EFFECTS:
  275    0271  1  !
  276    0272  1  !        NONE
  277    0273  1  !
  278    0274  1  !--
  279    0275  1
  280    0276  2     BEGIN
  281    0277  2     MAP
  282    0278  2         LINE_DSC: REF VECTOR [2]
  283    0279  2     ;
  284    0280  2
  285    0281  2     SYSOUTRAB [RAB$L_RBF] =                ! Store address of line
  286    0282  2               .LINE_DSC [1];
  287    0283  2     SYSOUTRAB [RAB$W_RSZ] =               ! Store size of line
  288    0284  2               .LINE_DSC [0];
  289    0285  3     RETURN $PUT (RAB = SYSOUTRAB)
  290    0286  3
  291    0287  1     END;
```

```
                                                    .EXTRN   SYS$PUT

                                  0004 00000         .ENTRY   NCP$WRITE_LINE, Save R2
                52 00000000'   00 9E 00002           MOVAB    SYSOUTRAB+40, R2
                50        04   AC D0 00009            MOVL     LINE_DSC, R0
                62        04   A0 D0 0000D            MOVL     4(R0), SYSOUTRAB+40
           FA   A2        60   B0 00011               MOVW     (R0), SYSOUTRAB+34
                         D8    A2 9F 00015            PUSHAB   SYSOUTRAB
        00000000G  00          01 FB 00018            CALLS    #1, SYS$PUT
                                  04 0001F            RET
```

; Routine Size: 32 bytes,   Routine Base: $CODE$ + 00AA

```
  293      0288  1  %SBTTL  'NCP$CMD_TERM_Q  Is input device a terminal?'
  294      0289  1  GLOBAL ROUTINE NCP$CMD_TERM_Q = !
  295      0290  1
  296      0291  1  !++
  297      0292  1  ! FUNCTIONAL DESCRIPTION:
  298      0293  1  !
  299      0294  1  !       Return true if input device is a terminal,
  300      0295  1  !       False otherwise.
  301      0296  1  !
  302      0297  1  ! FORMAL PARAMETERS:
  303      0298  1  !
  304      0299  1  !       NONE
  305      0300  1  !
  306      0301  1  ! IMPLICIT INPUTS:
  307      0302  1  !
  308      0303  1  !       NONE
  309      0304  1  !
  310      0305  1  ! IMPLICIT OUTPUTS:
  311      0306  1  !
  312      0307  1  !       NONE
  313      0308  1  !
  314      0309  1  ! ROUTINE VALUE:
  315      0310  1  ! COMPLETION CODES:
  316      0311  1  !
  317      0312  1  !       NONE
  318      0313  1  !
  319      0314  1  ! SIDE EFFECTS:
  320      0315  1  !
  321      0316  1  !       NONE
  322      0317  1  !
  323      0318  1  !--
  324      0319  1
  325      0320  2     BEGIN
  326      0321  2
  327      0322  2     IF  .SYSINFAB [$FAB_DEV (TRM)]          ! Is the terminal bit set?
  328      0323  2     THEN RETURN TRUE                       ! Yes
  329      0324  2     ELSE RETURN FALSE                      ! No
  330      0325  2
  331      0326  1     END;



                                         0000 00000         .ENTRY   NCP$CMD_TERM_Q, Save nothing       ; 0289
        04 00000000'  00                02 E1 00002         BBC      #2, SYSINFAB+64, 1$                ; 0322
                      50                01 D0 0000A         MOVL     #1, R0                             ; 0324
                                         04 0000D           RET                                        ;
                                      50 D4 0000E 1$:       CLRL     R0                                 ;
                                         04 00010           RET                                        ; 0326

; Routine Size: 17 bytes,   Routine Base: $CODE$ + 00CA
```

```
333    0327   1   %SBTTL  'NCP$EMPTY_INP  Is remainder of command blank'
334    0328   1   GLOBAL ROUTINE NCP$EMPTY_INP (DSC) =      !
335    0329   1
336    0330   1   !++
337    0331   1   ! FUNCTIONAL DESCRIPTION:
338    0332   1   !
339    0333   1   !       Return true if remainder of command line is blank
340    0334   1   !       false otherwise.
341    0335   1   !
342    0336   1   ! FORMAL PARAMETERS:
343    0337   1   !
344    0338   1   !     DSC                 Address of descriptor of remainder of command
345    0339   1   !
346    0340   1   ! IMPLICIT INPUTS:
347    0341   1   !
348    0342   1   !       NONE
349    0343   1   !
350    0344   1   ! IMPLICIT OUTPUTS:
351    0345   1   !
352    0346   1   !       NONE
353    0347   1   !
354    0348   1   ! ROUTINE VALUE:
355    0349   1   ! COMPLETION CODES:
356    0350   1   !
357    0351   1   !       Success or failure
358    0352   1   !
359    0353   1   ! SIDE EFFECTS:
360    0354   1   !
361    0355   1   !       NONE
362    0356   1   !
363    0357   1   !--
364    0358   1
365    0359   2     BEGIN
366    0360   2
367    0361   2     MAP
368    0362   2         DSC : REF VECTOR [2]                  ! Descriptor of command line
369    0363   2         ;
370    0364   2
371    0365   2     LITERAL
372    0366   2         SPACE = 32,                           ! Values of character codes
373    0367   2         TAB = 9
374    0368   2         ;
375    0369   2
376    0370   2     LOCAL
377    0371   2         LIN_ADR,                              ! Line address tmp
378    0372   2         END_ADR,                              ! End address
379    0373   2         CHAR                                  ! Character temporary
380    0374   2         ;
381    0375   2
382    0376   2     END_ADR = .DSC [1] + .DSC [0] - 1;   ! Set end address
383    0377   2     LIN_ADR = .DSC [1];                  ! Start address
384    0378   2
385    0379   2     WHILE .LIN_ADR LEQA .END_ADR          ! For the buffer
386    0380   2     DO
387    0381   3         BEGIN                             ! Look for a space or a tab
388    0382   3         CHAR = CH$RCHAR_A (LIN_ADR);      ! Fetch a character and advance
389    0383   3         IF      .CHAR NEQ SPACE AND
```

```
 ;  390     0384   3                .CHAR NEQ TAB
 ;  391     0385   3                THEN RETURN FALSE              ! If not, then not empty
 ;  392     0386   3                END
 ;  393     0387   2                .
 ;  394     0388   2            RETURN TRUE                       ! An empty line
 ;  395     0389   2
 ;  396     0390   1            END;
```

```
                                    0004 00000        .ENTRY   NCP$EMPTY_INP, Save R2           ;  0328
                           51    04  AC  D0 00002      MOVL     DSC, R1                          ;  0376
                 50    04  A1    61  C1 00006          ADDL3    (R1), 4(R1), R0
                           50    D7 0000B              DECL     END_ADR
                           51    04  A1  D0 0000D      MOVL     4(R1), LIN_ADR                   ;  0377
                           50    51  D1 00011 1$:      CMPL     LIN_ADR, END_ADR                ;  0379
                           0F    1A 00014              BGTRU    2$
                           52    81  9A 00016          MOVZBL   (LIN_ADR)+, CHAR                ;  0382
                           20    52  D1 00019          CMPL     CHAR, #32                       ;  0383
                           F3    13 0001C              BEQL     1$
                           09    52  D1 0001E          CMPL     CHAR, #9                        ;  0384
                           EE    13 00021              BEQL     1$
                           04    11 00023              BRB      3$                              ;  0385
                           50    01  D0 00025 2$:      MOVL     #1, R0                          ;  0388
                           04    00028              RET
                           50    D4 00029 3$:         CLRL     R0                              ;  0390
                           04    0002B              RET
```

; Routine Size: 44 bytes,   Routine Base: $CODE$ + 00DB

```
;  398       0391  1
;  399       0392  1
;  400       0393  1 END                                 !End of module
;  401       0394  0 ELUDOM
```

PSECT SUMMARY

Name	Bytes	Attributes
$PLIT$	19	NOVEC,NOWRT, RD ,NOEXE,NOSHR, LCL, REL, CON,NOPIC,ALIGN(2)
OWN	296	NOVEC, WRT, RD ,NOEXE,NOSHR, LCL, REL, CON,NOPIC,ALIGN(2)
$CODE$	263	NOVEC,NOWRT, RD , EXE,NOSHR, LCL, REL, CON,NOPIC,ALIGN(2)

Library Statistics

File	Total	Symbols Loaded	Percent	Pages Mapped	Processing Time
_255DUA28:[NCP.OBJ]NCPLIBRY.L32;1	373	4	1	52	00:00.1
_255DUA28:[SYSLIB]STARLET.L32;1	9776	39	0	581	00:01.5

COMMAND QUALIFIERS

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

; Size:         263 code + 315 data bytes
; Run Time:          00:10.8
; Elapsed Time:      00:39.7
; Lines/CPU Min:     2197
; Lexemes/CPU-Min: 29392
; Memory Used:  86 pages
; Compilation Complete
```

NCPSTANOD
LIS

NCPSTAVRB
LIS

NCPSTASHL
LIS

NCPSTAOBJ
LIS

NCPSTATRI
LIS

NCPSTAZER
LIS

NCPTERMIO
LIS

NCPTABLES
LIS

NCPURBACT
LIS

NCPURBACT
LIS