```
               ;********************************************************
               ;*                                                      *
               ;*              This program put new cp/m                *
               ;*         in Hard disk or Double Side Floppy disk       *
               ;*                                                      *
               ;********************************************************
               ;
                       title   DSPutSys 1.61 for NE CP/M with Hard-Disk
                       subttl  Copyright Studio Lg, Genova - Last rev 19/08/1984 10:52
                       ;       Programmers: Martino Stefano & Gallerani Paolo
                       ;
                       ;
0011                   vers    equ     17
                       ;
                       ;
0001                   true    equ     1
0000                   false   equ     0
                       ;
0000                   copyrig equ     false           ; flag for copyright message
                       ;
          C                    Include ASCII.LIB       ; ascii equivalents
          C            ;
          C            ;
          C            ;********************************************************
          C            ;*                                                      *
          C            ;*              ASCII EQUIVALENTS                        *
          C            ;*                                                      *
          C            ;********************************************************
          C            ;
0007      C            bell    equ     'G'-'@'         ; ring beeper
0008      C            backsp  equ     'H'-'@'         ; back space char.
0009      C            tab     equ     'I'-'@'         ; tabulation char.
000A      C            lf      equ     'J'-'@'         ; line-feed char.
000C      C            ffeed   equ     'L'-'@'         ; form feed char.
000D      C            cr      equ     'M'-'@'         ; carriage-return char.
0013      C            pfx     equ     'S'-'@'         ; attributes pfx
0048      C            rever   equ     'H'             ; Reverse On    (^SH)
0043      C            flash   equ     'C'             ; Flash On      (^SC)
0040      C            norm    equ     '@'             ; Normal        (^S@)
0020      C            space   equ     ' '             ; space char.
0024      C            endmsg  equ     '$'             ; end of print message
          C            ;
                       ;
                       page    62
```

```
                  C            Include ROMENTRY.LIB   ; Rom entry points
                  C        ;
                  C        ;
                  C        ;**********************************************************
                  C        ;*                                                        *
                  C        ;*              Rom routines address                      *
                  C        ;*                                                        *
                  C        ;**********************************************************
                  C        ;
F000              C        rom     equ     0F000h          ; <--- rom starting address
F003              C        cin     equ     rom+3           ; console input
F006              C        cout    equ     rom+6           ; console output
F009              C        csts    equ     rom+9           ; console status
F00C              C        lout    equ     rom+12          ; printer output
F00F              C        lsts    equ     rom+15          ; printer status
F012              C        fdios   equ     rom+18          ; fdd I/O 128 byte
F015              C        fdiod   equ     rom+21          ; fdd I/O 256 byte
F018              C        wdini   equ     rom+24          ; wdd initialization
F01B              C        wdio    equ     rom+27          ; wdd I/O 256 byte
F01E              C        strout  equ     rom+30          ; print string .DE until $
F01E              C        print   equ     strout          ; sinonime
F021              C        bootrom equ     rom+33          ; load BIOS and go to wboote
F024              C        printat equ     rom+36          ; print str. -) DE at -) HL cursor
F027              C        movcurs equ     rom+39          ; move cursor at -) HL
F02A              C        vidinit equ     rom+42          ; initialize video
F02D              C        CompFlg equ     rom+45          ; Version Number
                  C        ;
                           ;
                           ;
                           ;**********************************************************
                           ;*              Hard Disk Status Port                     *
                           ;**********************************************************
                           ;
00B9                       rport1  equ     0b9h            ; sasi read port 1 - read status
                           ;
                           ;
                           ;**********************************************************
                           ;*                                                        *
                           ;*              BDOS FUNCTIONS                             *
                           ;*                                                        *
                           ;**********************************************************
                           ;
0005                       bdos    equ     0005            ; bdos entry point
                           ;
0001                       bcinp   equ     01              ; input one char. from console
0002                       bcout   equ     02              ; output one char. to console
0009                       bprint  equ     09              ; output buffer to console
000A                       bstrinp equ     10              ; input buffer from console
000F                       bopen   equ     15              ; open file
0010                       bclose  equ     16              ; close file
0014                       bread   equ     20              ; read next sector
001A                       dma     equ     26              ; set dma address
                           ;
                           ;
                           page
```

```
                            ;
                            ;
                            ;********************************************************
                            ;* P U T S Y S H                                      *
                            ;*              Set stack and go to setup             *
                            ;*                                                    *
                            ;********************************************************
                            ;
0000'                           Aseg
                                Org     100h            ; On TPA
                                ;
0100   31 02A5                  ld      sp,stack        ; set stack pointer
0103   C3 02F0                  jp      putsys          ; go to put system
                            ;
                            ;
                            ;
                                if      copyrig
                                defb    ' COPYRIGHT (c) 1983, 1984 by STUDIO Lg, Genova, ITALY '
                                endif
                            ;
                            ;
0106   0D 0A 07 49      No4.2:  defb    cr,lf,bell,'Incompatible Version Of EPROM',endmsg
010A   6E 63 6F 6D
010E   70 61 74 69
0112   62 6C 65 20
0116   56 65 72 73
011A   69 6F 6E 20
011E   4F 66 20 45
0122   50 52 4F 4D
0126   24

                            ;
                            ;
                            ;
0127                        wdfatmsg:
0127   0D 0A 55 6E          defb    cr,lf,'Unrecoverable error in hard disk',cr,lf
012B   72 65 63 6F
012F   76 65 72 61
0133   62 6C 65 20
0137   65 72 72 6F
013B   72 20 69 6E
013F   20 68 61 72
0143   64 20 64 69
0147   73 6B 0D 0A
014B                        setnew:
014B   53 65 74 20          defb    'Set new system diskette in drive A,',cr,lf
014F   6E 65 77 20
0153   73 79 73 74
0157   65 6D 20 64
015B   69 73 6B 65
015F   74 74 65 20
0163   69 6E 20 64
0167   72 69 76 65
016B   20 41 2C 0D
016F   0A
0170   74 68 65 6E          defb    'then push return.',endmsg
0174   20 70 75 73
0178   68 20 72 65
017C   74 75 72 6E
```

```
0180    2E 24                               ;
                                            ;
                                            ;
                                            ;
0182                            inimsg:
0182    0D 0A 13 48                     defb    cr,lf,pfx,'HDouble Side PUTSYS Vers. ',vers/10+'0','.',vers mod 10+'0',pfx,'@',cr,l
0186    44 6F 75 62
018A    6C 65 20 53
018E    69 64 65 20
0192    50 55 54 53
0196    59 53 20 56
019A    65 72 73 2E
019E    20 31 2E 37
01A2    13 40 0D 0A
01A6    0D 0A 50 75                     defb    cr,lf,'Put system to Hard disk or to Floppy disk (H/F) ?',endmsg
01AA    74 20 73 79
01AE    73 74 65 6D
01B2    20 74 6F 20
01B6    48 61 72 64
01BA    20 64 69 73
01BE    6B 20 6F 72
01C2    20 74 6F 20
01C6    46 6C 6F 70
01CA    70 79 20 64
01CE    69 73 6B 20
01D2    28 48 2F 46
01D6    29 20 3F 24
                                            ;
                                            ;
01DA                            sizemsg:
01DA    0D 0A 0A 43                     defb    cr,lf,lf,'Choose your system configuration size,'
01DE    68 6F 6F 73
01E2    65 20 79 6F
01E6    75 72 20 73
01EA    79 73 74 65
01EE    6D 20 63 6F
01F2    6E 66 69 67
01F6    75 72 61 74
01FA    69 6F 6E 20
01FE    73 69 7A 65
0202    2C
0203    0D 0A 66 72                     defb    cr,lf,'from following ones: 32,40,48,56 kbyte ',endmsg
0207    6F 6D 20 66
020B    6F 6C 6C 6F
020F    77 69 6E 67
0213    20 6F 6E 65
0217    73 3A 20 33
021B    32 2C 34 30
021F    2C 34 38 2C
0223    35 36 20 6B
0227    62 79 74 65
022B    20 24
                                            ;
                                            ;
022D                            fdrdymsg:
022D    0D 0A                       defb    cr,lf
022F    0D 0A 54 79                     defb    cr,lf,'Type Disk Name to put system [^C to exit] ',endmsg
0233    70 65 20 44
```

```
0237    69 73 6B 20
023B    4E 61 6D 65
023F    20 74 6F 20
0243    70 75 74 20
0247    73 79 73 74
024B    65 6D 20 5B
024F    5E 43 20 74
0253    6F 20 65 78
0257    69 74 5D 20
025B    24

                        ;
                        ;
025C                    nofilmsg:
025C    0D 0A 07 46             defb    cr,lf,bell,'File not found : ',endmsg
0260    69 6C 65 20
0264    6E 6F 74 20
0268    66 6F 75 6E
026C    64 20 3A 20
0270    24

                        ;
0271                    errmsg:
0271    0D 0A 07 44             defb    cr,lf,bell,'Disk I/O error',cr,lf,endmsg
0275    69 73 6B 20
0279    49 2F 4F 20
027D    65 72 72 6F
0281    72 0D 0A 24

                        ;
                        ;
                        ;
0285                            defs    32              ; stack data areas
02A5                    stack   equ     $               ; stack top
                        ;
                        ;
02A5                    putflag:
02A5                            defs    1               ; put system flag
                        ;
02A6                    comdat:
02A6                            defs    2               ;
                        ;
                        ;
02A8                    conbuff:
02A8    02                      defb    2               ; two char. for input
02A9                            defs    8               ; free areas
                        ;
                        ;
02B1                    fcb:
02B1    00                      defb    0               ; logical disk
02B2    53 59 53 33             defb    'SYS32   OVR'   ; name of file to open
02B6    32 20 20 20
02BA    4F 56 52
02BD                            defs    32              ; file control block areas
                        ;
                        ;
                        ;
02DD                    xlt:
                        ; sector translate table
02DD    01 07 03 09             defb    1,7,3,9,5,2,8,4,10,6
02E1    05 02 08 04
```

```
02E5    0A 06
02E7    FF                              defb    255             ; flag for end track
                                ;
                                ;
02E8                            PutTab:
02E8    00              PutDsk: defb    0               ; unit 0 - side 0
02E9    0000            PutTrk: defw    0               ; track 0000
02EB    01              PutSec: defb    1               ; sector 0
02EC    045A            PutDma: defw    cpmbuff         ; dma adrs
02EE    01                      defb    1               ; write code
02EF    1D                      defb    29              ; block count (29 sector 256 byte)
                                ;                       ; for wdd putsys
                                page
```

```
                        ;
                        ;
                        ;*********************************************************
                        ;* P U T S Y S                                          *
                        ;*********************************************************
                        ;
02F0                    putsys:
02F0   3A F02D                  ld      a,(CompFlg)      ; Check for proper version
02F3   FE 2A                    cp      42               ; must be greater 42
02F5   38 5C                    jr      c,BadVer         ; else error
02F7   DB B9                    in      a,(rport1)       ; load cntlr status bits
02F9   E6 E0                    and     11100000b        ; mask bit 5,6,7. Hard disk exist ?
02FB   20 20                    jr      nz,puts01        ; no, then put system to floppy disk
                        ;
02FD   11 0182                  ld      de,inimsg        ; D.E = initial message
0300   CD 0430                  call    printst          ; print it
0303                    puts0:
0303   CD 041F                  call    cinput           ; wait one char.
0306   FE 20                    cp      ' '              ; ( ' ' ?
0308   38 F9                    jr      c,puts0          ; yes, ignore
030A   CB AF                    res     5,a              ; convert up-case
030C   FE 46                    cp      'F'              ; floppy disk ?
030E   28 0D                    jr      z,puts01         ; yes, then go to fdd system put
0310   FE 48                    cp      'H'              ; hard disk ?
0312   3E 00                    ld      a,0              ; set put to wdd
0314   28 09                    jr      z,puts2          ;  continue
                        ;
0316                    invalid:
0316   1E 08                    ld      e,backsp         ; back space char.
0318   CD 042B                  call    coutput          ; printst it
031B   18 E6                    jr      puts0            ;
                        ;
031D                    puts01:
031D   3E 01                    ld      a,1              ; set put to floppy
031F                    puts2:
031F   32 02A5                  ld      (putflag),a      ; set put system flag (0 = hard, 1 = floppy)
0322                    puts2.1:
0322   11 01DA                  ld      de,sizemsg       ; D.E = size message
0325   CD 0430                  call    printst          ; print it
0328   CD 0435                  call    strinput         ; wait two char.
032B   11 02A9                  ld      de,conbuff+1     ; point to # char
032E   1A                       ld      a,(de)           ; get #
032F   FE 02                    cp      2                ; 2 char
0331   20 EF                    jr      nz,puts2.1       ; no, ignore
0333   13                       inc     de               ; point to char
0334   1A                       ld      a,(de)           ; get 1' char.
0335   32 02B5                  ld      (fcb+4),a        ; put to fcb
0338   13                       inc     de               ; point to 2'
0339   1A                       ld      a,(de)           ; get 2' char.
033A   32 02B6                  ld      (fcb+5),a        ; put to fcb
033D   CD 0442                  call    open             ; open SY5xx.OVR
0340   3C                       inc     a                ; successful ?
0341   20 1C                    jr      nz,puts3         ; yes, then count
                        ;
0343                    nofile:
0343   11 025C                  ld      de,nofilmsg      ; D.E = no file message
```

```
0346   CD 0430              call    printst         ; print it
0349   3E 24                ld      a,'$'           ; $ = string terminator
034B   32 02BD              ld      (fcb+12),a      ; put it at end of fcb
034E   11 02B2              ld      de,fcb+1        ; point top char. of fcb
0351   18 03                jr      err             ; print & return to cp/m
                            ;
0353                BadVer:
0353   11 0106              ld      de,No4.2        ; No 4.2 Eprom
0356                err:
0356   CD 0430              call    printst         ; print fcb+1
0359   CD 0424              call    crlf            ; print cr & lf
035C   C3 0000              jp      0               ; return to cp/m
                            ;
035F                puts3:
035F   06 3A                ld      b,2+44+12       ; IPL+(ccp+bdos)+bios sector count
0361   11 045A              ld      de,cpmbuff      ; load cp/m buffer
0364                puts4:
0364   ED 53 02A6           ld      (cpmdat),de     ;
0368   C5                   push    bc              ; save counter
0369   CD 043D              call    SetDma          ; set new dma
036C   CD 0452              call    fread           ; read next sector
036F   B7                   or      a               ; successful ?
0370   20 11                jr      nz,rderr        ; no, then error
0372   2A 02A6              ld      hl,(cpmdat)     ; get old dma address
0375   11 0080              ld      de,128          ; cp/m sector size
0378   19                   add     hl,de           ; new dma
0379   EB                   ex      de,hl           ; de = next dma addrs
037A   C1                   pop     bc              ; restore counter
037B   10 E7                djnz    puts4           ; loop for all
                            ;
037D                puts50:
037D   CD 044A              call    close           ; close file SYSxx.OVR
0380   3C                   inc     a               ; successful ?
0381   20 16                jr      nz,puts6        ; yes, then count
                            ;
0383                rderr:
0383   11 0271              ld      de,errmsg       ; print error
0386   CD 0430              call    printst         ; message and
0389   11 014B              ld      de,setnew       ; set new message
038C   CD 0430       PrMsg: call    printst         ; print it
038F                waitcr:
038F   CD 041F              call    cinput          ; wait a key
0392   FE 0D                cp      cr              ; cr ?
0394   20 F9                jr      nz,waitcr       ; no, ignore
0396   C3 F021              jp      bootrom         ; A()0, boot from floppy
                            ;
0399                puts6:
                            ; at this point, IPL + cp/m has been loaded in cp/m buffer
                            ;
0399   3A 02A5              ld      a,(putflag)     ; load put system flag
039C   B7                   or      a               ; test for hard or for floppy
039D   20 12                jr      nz,fddput       ; no zero, then go to fdd put system
                            ;
                            ;
                            ;
                            ;****************************************************
                            ;* W D D P U T                                      *
                            ;*          Put IPL + CP/M in Hard Disk 0            *
                            ;****************************************************
```

```
                              ;
    039F                      wddput:
                              ; put new cp/m in hard disk
    039F   CD F018            call    wdini          ; initialize wdd
    03A2   21 02E8            ld      hl,PutTab      ; H.L = wdd put system table
    03A5   CD F01B            call    wdio           ; write cp/m
    03A8   11 0127            ld      de,wdfatmsg    ; Hard Msg Pointer
    03AB   B7                 or      a              ; error occurs ?
    03AC   20 DE              jr      nz,PrMsg       ; yes, then go to error
    03AE   C3 0413            jp      EndPut         ; done, go to boot
                              ;
                              ;
                              ;********************************************************
                              ;* F D D P U T                                         *
                              ;*     Put IPL + CP/M in Double Floppy Disk 0 or 1      *
                              ;********************************************************
                              ;
    03B1                      fddput:
    03B1   11 022D            ld      de,fdrdymsg    ; DE = fdd ready message
    03B4   CD F01E            call    print          ; print it
    03B7                      PutD:
    03B7   CD 041F            call    cinput         ; wait one char.
    03BA   FE 03              cp      'C'-'@'         ; is cntrl C ?
    03BC   CA 0413            jp      z,EndPut       ; yes, then exit
    03BF   FE 20              cp      ' '            ; ( ' ' ?
    03C1   38 F4              jr      c,PutD         ; yes, ignore
    03C3   CB AF              res     5,a            ; convert up-case
    03C5   FE 41              cp      'A'            ; A:
    03C7   28 0B              jr      z,FdPDsk       ; yes, accept
    03C9   FE 42              cp      'B'            ; B:
    03CB   28 07              jr      z,FdPDsk       ;   continue
                              ;
    03CD   1E 08              ld      e,backsp       ; back space char.
    03CF   CD 042B            call    coutput        ; print it
    03D2   18 E3              jr      PutD           ;
                              ;
    03D4                      FdPDsk:                           Parab:
    03D4   D6 41              sub     'A'            ; A->0, B->1
    03D6   32 02E8            ld      (PutDsk),a     ; set unit & Side 0
    03D9   AF                 xor     a              ; clear accumulator
    03DA   32 02E9            ld      (PutTrk),a     ; set track 0
    03DD   21 045A            ld      hl,cpmbuff     ; HL = cp/m buffer top adrs
    03E0   22 02EC            ld      (PutDma),hl    ; set dma to cp/m buff top adrs
    03E3                      FdPTrk:
    03E3   11 02DD            ld      de,xlt         ; Skew Fact Table
                              ;
    03E6                      FdPSec:
    03E6   D5                 push    de             ; Save Reg
    03E7   1A                 ld      a,(de)         ; Get phisical
    03E8   32 02EB            ld      (PutSec),A     ;
    03EB   21 02E8            ld      hl,PutTab      ; Point to Table
    03EE   CD F015            call    fdiod          ; Exec I/O
    03F1   D1                 pop     de             ; Restore
    03F2   B7                 or      a              ; Any Error
    03F3   20 8E              jr      nz,rderr       ; Yes, Abort
    03F5   21 02ED            ld      hl,PutDma+1    ; Current High DMA Add
    03F8   34                 inc     (hl)           ; + 256 (Sector Size)
    03F9   13                 inc     de             ; Next Sec
```

```
03FA  7B                      ld      a,e             ; check for end track
03FB  FE E7                   cp      low (xlt+10)    ;
03FD  20 E7                   jr      nz,FdPSec       ; No, next sec
03FF  21 02E8                 ld      hl,PutDsk       ; Point to Side
0402  CB 66                   bit     4,(hl)          ; check for Side 0
0404  CB E6                   set     4,(hl)          ; set side 1
0406  28 DB                   jr      z,FdPTrk        ; Yes, Read Side 1
0408  CB A6                   res     4,(hl)          ; else Side 0
040A  23                      inc     hl
040B  34                      inc     (hl)            ; of Next Track
040C  3E 02                   ld      a,2             ; Write 2 Tracks
040E  BE                      cp      (hl)
040F  20 D2                   jr      nz,FdPTrk       ; No, again
0411  18 9E                   jr      fddput          ; and count for another disk
                              ;
                              ;
0413          endfddput:
0413          EndPut:
                              ; new cp/m has been written on Hard or floppy disk
                              ;
0413  DB B9                   in      a,(rport1)      ; load cntlr status bits
0415  E6 E0                   and     11100000b       ; mask bit 5,6,7. Hard disk exist ?
0417  CA F021                 jp      z,bootrom       ; yes, then reload system to hard disk
041A  3E 01                   ld      a,1             ; flag for load cp/m to floppy
041C  C3 F021                 jp      bootrom         ; jump to boot rom
                              ;
                              page
```

```
                                ;
                                ;
                                ;**********************************************************
                                ;*                  BDOS FUNCTIONS                        *
                                ;**********************************************************
                                ;
        041F                    cinput: ; Console input in A reg
                                        ;
        041F    0E 01                   ld      c,bcinp
        0421    C3 0005                 jp      bdos
                                ;
        0424                    crlf:
                                        ; Print Cr, Lf
                                        ;
        0424    1E 0D                   ld      e,cr
        0426    CD 042B                 call    coutput
        0429    1E 0A                   ld      e,lf
                                ;
        042B                    coutput:
                                        ; Print Char in A reg
                                        ;
        042B    0E 02                   ld      c,bcout
        042D    C3 0005                 jp      bdos
                                ;
        0430                    printst:; Print string pointed by DE
                                        ;
        0430    0E 09                   ld      c,bprint
        0432    C3 0005                 jp      bdos
                                ;
        0435                    strinput: ; Read input from console (DE.)
                                        ;
        0435    11 02A8                 ld      de,conbuff
        0438    0E 0A                   ld      c,bstrinp
        043A    C3 0005                 jp      bdos
                                ;
        043D                    SetDma: ; Set DMA add from DE
                                        ;
        043D    0E 1A                   ld      c,dma
        043F    C3 0005                 jp      bdos
                                ;
        0442                    open:   ; Open File (DE.FCB)
                                        ;
        0442    11 02B1                 ld      de,fcb
        0445    0E 0F                   ld      c,bopen
        0447    C3 0005                 jp      bdos
                                ;
        044A                    close:  ; Close File (DE.FCB)
                                        ;
        044A    11 02B1                 ld      de,fcb
        044D    0E 10                   ld      c,bclose
        044F    C3 0005                 jp      bdos
                                ;
        0452                    fread:  ; Read Seq (DE.FCB)
                                        ;
        0452    11 02B1                 ld      de,fcb
        0455    0E 14                   ld      c,bread
```

```
0457    C3 0005                     jp      bdos
                            ;
                            ;
045A                        cpmbuff equ     $               ; space for IPL+(ccp+bdos)+bios
                            ;
                            ;
                                    end     100h            ; end of this program
```

Macros:

Symbols:
```
BACKSP 0008    BADVER 0353    BCINP  0001    BCLOSE 0010
BCOUT  0002    BDOS   0005    BELL   0007    BOOTRO F021
BOPEN  000F    BPRINT 0009    BREAD  0014    BSTRIN 000A
CIN    F003    CINPUT 041F    CLOSE  044A    COMPFL F02D
CONBUF 02A8    COPYRI 0000    COUT   F006    COUTPU 042B
CPMBUF 045A    CPMDAT 02A6    CR     000D    CRLF   0424
CSTS   F009    DMA    001A    ENDFDD 0413    ENDMSG 0024
ENDPUT 0413    ERR    0356    ERRMSG 0271    FALSE  0000
FCB    02B1    FDDPUT 03B1    FDIOD  F015    FDIOS  F012
FDPDSK 03D4    FDPSEC 03E6    FDPTRK 03E3    FDRDYM 022D
FFEED  000C    FLASH  0043    FREAD  0452    INIMSG 0182
INVALI 0316    LF     000A    LOUT   F00C    LSTS   F00F
MOVCUR F027    NO4.2  0106    NOFILE 0343    NOFILM 025C
NORM   0040    OPEN   0442    PFX    0013    PRINT  F01E
PRINTA F024    PRINTS 0430    PRMSG  038C    PUTD   03B7
PUTDMA 02EC    PUTDSK 02E8    PUTFLA 02A5    PUTS0  0303
PUTS01 031D    PUTS2  031F    PUTS2. 0322    PUTS3  035F
PUTS4  0364    PUTS50 037D    PUTS6  0399    PUTSEC 02EB
PUTSYS 02F0    PUTTAB 02E8    PUTTRK 02E9    RDERR  0383
REVER  0048    ROM    F000    RPORT1 00B9    SETDMA 043D
SETNEW 014B    SIZEMS 01DA    SPACE  0020    STACK  02A5
STRINP 0435    STROUT F01E    TAB    0009    TRUE   0001
VERS   0011    VIDINI F02A    WAITCR 038F    WDDPUT 039F
WDFATM 0127    WDINI  F018    WDIO   F01B    XLT    02DD
```

No Fatal error(s)