```
                        @;
                        @;
                        @;DISK ERROR CODES
                        @;
2002            @CRC        ==       02h        ;CRC ERROR
3343            @WPROT      =-       40H        ;WRITE PROTECT
2221            @RNF        ==       21H        ;RECORD NOT FOUND
                        @;
                        @;
                        @;
                        @;
                        @;THIS IS THE USER PATCH AREA
                        @;
                        @;THIS CODE MUST NOT EXCEED 256 BYTES IN LENGTH
                        @;AND IS LOCATED ON TRACK 1 SECTOR 6  YOU MAY USE
                        @;THE RD 16 <MEMORY ADDRESS> 1;TO GET IT FROM THE
                        @;DISK AND WR 16 <MEMORY ADDRESS> 1 TO RESTORE IT
                        @;ONCE YOU HAVE MODIFIED IT BUT THE SECOND HALF OF
                        @;THIS 512 BYTE SECTOR MUST REMAIN UNCHANGED
                        @;
                        @;
                        @;
                        @;YOU MAY ALSO MODIFY THE CODE CREATED BY NSRELOC
                        @;USING A MONITOR OR DEBUGER THIS USER AREA
                        @;STARTS AT 2200H WHEN TPMXX.COM IS LOADED
                        @;
                        @;
                        @;HORIZON IO
                        @;
2200'                   @USER:
2200'   C3 022D'        @          JMP      UNIT       ;INITIALIZE
2203'   C3 2251'        @          JMP      UIN        ;CONSOLE INPUT
2206'   C3 024A'        @          JMP      UREAD      ;READER INPUT
2209'   C3 0299'        @          JMP      UOUT       ;CONSOLE OUTPUT
220C'   C3 0285'        @          JMP      UPUNCH     ;PUNCH OUTPUT
220F'   C3 029E'        @          JMP      ULIST      ;LIST OUTPUT
2212'   C3 0209'        @          JMP      USTAT      ;CONSOLE STATUS
2215'   C3 02F3'        @%IIOS:    JMP      IOCHK      ;I/O CHECK
2218'   C3 02FE'        @%AIOS:    JMP      IOSET      ;I/O SET
221B'   C3 0234'        @          JMP      RETURN     ;MEMORY LIMIT CHECK
221E'                   @ZAPTRP:
221E'   C3 0234'        @          JMP      RETURN     ;BREAKPOINT
2221'                   @%DATE:
2221'   C3 0302'        @          JMP      DATE                  ;USER DATE
2224'                   @%TIME:
2221'   C3 0305'        @    -     JMP      TIME                  ;USER TIME
2227'                   @%STDAT:
2227'   C3 030F'        @          JMP      STDAT                 ;USER SET DATE
222A'                   @%STTIM:
222A'   C3 0313'        @          JMP      STTIM                 ;USER SET TIME
```

```
                        @;
                        @;*****************************************************************
                        @;
                        @;****** D O    N O T   C H A N G E   T H E   **************
                        @;
                        @;****** L O C A T I O N S   O R   O R D E R **************
                        @;
                        @;****** O F   T H E   A B O V E   J U M P   **************
                        @;
                        @;****** V E C T O R S                       **************
                        @;
                        @;*****************************************************************
                        @;
                        @;I/O EQUATES
                        @;
                        @;
  0003                  @IOBYTE  ==      03H      ;I/O BYTE
                        @;
                        @;
  022D'                 @UNIT:
  022D'   AF            @         XRA     A
  222E'   32 0003       @         STA     IOBYTE   ;ZERO I/O BYTE
  0231'   D306          @         OUT     6
  0233'   3ECE          @         MVI     A,0CEH
  0235'   D303          @         OUT     3
  0237'   D305          @         OUT     5
  0239'   3E37          @         MVI     A,37H
  023B'   D303          @         OUT     3
  023D'   D305          @         OUT     5
  023F'   DB02          @         IN      2
  0241'   DB04          @         IN      4
  2243'   3E30          @         MVI     A,30H
  0245'   D306          @         OUT     6
  0247'   C3 0000       @         JMP     0        ;DONE RETURN TO SYSTEM
                        @;
                        @;CONSOLE INPUT
                        @;
  024A'                 @URFAD:
  024A'   3A 0003       @         LDA     IOBYTE
  024D'   1F            @         RAR
  024E'   1F            @         RAR
  024F'   1803          @         JMPR    CIN
  0251'                 @UIN:
  0251'   3A 0003       @         LDA     IOBYTE
  0254'                 @CIN:
  0254'   E602          @         ANI     2
  0256'   FE02          @         CPI     2
  0258'   281A          @         JRZ     CIN2
  025A'   FE01          @         CPI     1
  025C'   2803          @         JRZ     CIN1
  025E'                 @CIN0:
  025E'   DB03          @         IN      3
  0260'   E602          @         ANI     2
  0262'   28FA          @         JRZ     CIN0
```

```
0264'     DB02          @        IN      2
0266'     E67F          @        ANI     7FH
0268'     C9            @        RET
                        @;
0269'                   @CIN1:
0269'     DB05          @        IN      5
026B'     E602          @        ANI     2
026D'     28FA          @        JRZ     CIN1
026F'     DB04          @        IN      4
0271'     E67F          @        ANI     7FH
0273'     C9            @        RET
                        @;
0274'                   @CIN2:
0274'     DB06          @        IN      6
0276'     E602          @        ANI     2
0278'     28FA          @        JRZ     CIN2
027A'     DB00          @        IN      0
027C'     F5            @        PUSH    PSW
027D'     3E30          @        MVI     A,30H
027F'     D306          @        OUT     6
0281'     F1            @        POP     PSW
0282'     E67F          @        ANI     7FH
0284'                   @RETURN:
0284'     C9            @        RET
                        @;
                        @;
                        @;CONSOLE OUTPUT
                        @;
0285'                   @UPUNCH:
0285'     3A 0003       @        LDA     IOBYTE
0288'     1F            @        RAR
0289'     1F            @        RAR
028A'     1F            @        RAR
028B'     1F            @        RAR
028C'     180E          @        JMPR    CCUT
028E'     .             @ULIST:
028E'     3A 0003       @        LDA     IOBYTE
0291'     1F            @        RAR
0292'     1F            @        RAR
0293'     1F            @        RAR
0294'     1F            @        RAR
0295'     1F            @        RAR
0296'     1F            @        RAR
0297'     1803          @        JMPR    CCUT
0299'                   @UOUT:
0299'     3A 0003       @        LDA     IOBYTE
029C'                   @CCUT:
029C'     E602          @        ANI     2
029E'     FE01          @        CPI     1
02A0'     280E          @        JRZ     CCUT1
02A2'     FE02          @        CPI     2
02A4'     2814          @        JRZ     COUT2
02A6'                   @CCUT2:
02A6'     DB03          @        IN      3
```

CDL'S Z80 Macro Assembler E12011-0311
PL-NSDD  -0130 - 04/19/80 05:46:46
PIOS    - TPM PIOS FOR NORTH * STAR DOUBLE DENSITY
USER PATCH AREA

```
02A8'    E601         @           ANI      1
02AA'    28FA         @           JRZ      COUT0
02AC'    79           @           MOV      A,C
02AD'    D302         @           OUT      2
02AF'    C9           @           RET
                      @;
02B0'                 @COUT1:
02B0'    DB05         @           IN       5
02B2'    E601         @           ANI      1
02B4'    28FA         @           JRZ      COUT1
02B6'    79           @           MOV      A,C
02B7'    D304         @           OUT      4
02B9'    C9           @           RET
                      @;
02BA'                 @COUT2:
02BA'    DB06         @           IN       6
02BC'    E601         @           ANI      1
02BE'    28FA         @           JRZ      CCUT2
02C0'    79           @           MOV      A,C
02C1'    D300         @           OUT      0
02C3'    3E20         @           MVI      A,20H
02C5'    D306         @           OUT      6
02C7'    79           @           MOV      A,C
02C8'    C9           @           RET
                      @;
                      @;CONSOLE STATUS
                      @;
02C9'                 @USTAT:
02C9'    3A 0003      @           LDA      IOBYTE
02CC'    E602         @           ANI      2
02CE'    FE02         @           CPI      2
02D0'    2814         @           JRZ      USTAT2
02D2'    FE01         @           CPI      1
02D4'    2308         @           JRZ      USTAT1
02D6'    DB03         @           IN       3
02D8'    E602         @           ANI      2
02DA'    C8           @           RZ
02DB'    3EFF         @           MVI      A,0FFH
02DD'    C9           @           RET
02DE'                 @USTAT1:
02DE'    DB05         @           IN       5
02E0'    E602         @           ANI      2
02E2'    C8           @           RZ
02E3'    3EFF         @           MVI      A,0FFH
02E5'    C9           @           RET
02E6'                 @USTAT2:
02E6'    DB06         @           IN       6
02E8'    E602         @           ANI      2
02EA'    C8           @           RZ
02EB'    3EFF         @           MVI      A,0FFH
02ED'    C9           @           RET
                      @;
                      @;
                      @;SET I/O BYTE
```

```
                           @;
  02EE'                    @IOSET:
  02EE'   79               @        MOV     A,C        ;GET I/O BYTE INTO ACC
  02EF'   32 0003          @        STA     IOBYTE     ;STORE IT
  02F2'   C9               @        RET
                           @;
                           @;
                           @;RETURN I/O BYTE IN ACCUM.
                           @;
  02F3'                    @IOCHK:
  02F3'   3A 0003          @        LDA     IOBYTE     ;GET I/O BYTE
  02F6'   C9               @        RET
  02F7'                    @        .BLKB   256-(.-USER)
                           @;
                           @;YOU MAY REPLACE THESE SEGMENTS WITH YOUR OWN DRIVERS
                           @;IF YOU HAVE A REAL TIME CLOCK.
                           @;OR IF SPACE IS A PROBLEM JUMP TO A ROM CLOCK DRIVER.
                           @;
                           @;
  0300'   21 004B          @DATE:   LXI     H,DATE1V           ;DATE
  0303'   1303             @        JMPR    DODTTM             ;
  0305'   21 0048          @TIME:   LXI     H,TIME1V           ;TIME
  0308'   46               @DODTTM: MOV     B,M                ;
  0309'   23               @        INX     H                  ;
  030A'   4E               @        MOV     C,M                ;
  030B'   23               @        INX     H                  ;
  030C'   56               @        MOV     D,M                ;
  030D'   C9               @        RET                        ;
  030E'   11 004B          @STDAT:  LXI     D,DATE1V           ;DATE
  0311'   1803             @        JMPR    DOSDT              ;
  0313'   11 0048          @STTIM:  LXI     D,TIME1V           ;TIME
  0316'   60               @DOSDT:  MOV     H,B                ;FROM
  0317'   69               @        MOV     L,C                ;
  0318'   01 0003          @        LXI     B,3                ;
  031B'   EDB0             @        LDIR                       ;MOVE
  031D'   C9               @        RET                        ;
                           @;
                           @;
                           @;
                           @;
```

```
                                  ;
                                  ;
0396'   0023          DT.SIN: .WORD   35                      ;TRACKS
0398'   14                    .BYTE   20                      ;SECTORS
0399'   08                    .BYTE   8                       ;SECTORS/BLOCK
039A'   0003                  .WORD   3                       ;DIRECTORY TRACK
039C'   0040                  .WORD   64                      ;DIRECTORY ENTRIES
039E'   0050                  .WORD   (20*(35-3))/8           ;BLOCKS
03A0'   000B                  .WORD   ((20*(35-3))/8+1+7)/8 ;ALLOCATION
03A2'   03                    .BYTE   3                       ;LOG2(BLOCK SIZE)
03A3'   01                    .BYTE   1                       ;KB/BLOCK
03A4'   02                    .BYTE   2                       ;MAX ERRORS
03A5'   14                    .BYTE   20                      ;TRACK 0 SECTORS
03A6'   00                    .BYTE   00000000B               ;FLAGS (NO TRANSLATE)
03A7'   0023          DT.DBL: .WORD   35                      ;TRACKS
03A9'   28                    .BYTE   40                      ;SECTORS
03AA'   08                    .BYTE   8                       ;SECTORS/BLOCK
03AB'   0002                  .WORD   2                       ;DIRECTORY TRACK
03AD'   0040                  .WORD   64                      ;DIRECTORY ENTRIES
03AF'   00A5                  .WORD   (40*(35-2))/8           ;BLOCKS
03B1'   0015                  .WORD   ((40*(35-2))/8+1+7)/8 ;ALLOCATION
03B3'   03                    .BYTE   3                       ;LOG2(BLOCK SIZE)
03B4'   01                    .BYTE   1                       ;KB/BLOCK
03B5'   02                    .BYTE   2                       ;MAX ERRORS
03B6'   28                    .BYTE   40                      ;TRACK 0 SECTORS
03B7'   01                    .BYTE   00000001B               ;FLAGS (NO TRANSLATE)
03B8'          SCTBL:
03B8'   00010203              .BYTE   00,01,02,03
03BC'   14151617              .BYTE   20,21,22,23
03C0'   04050607              .BYTE   04,05,06,07
03C4'   18191A1B              .BYTE   24,25,26,27
03C8'   08090A0B              .BYTE   08,09,10,11
03CC'   1C1D1E1F              .BYTE   28,29,30,31
03D0'   0C0D0E0F              .BYTE   12,13,14,15
03D4'   20212223              .BYTE   32,33,34,35
03D8'   10111213              .BYTE   16,17,18,19
03DC'   24252627              .BYTE   36,37,38,39
```