Humpty Dumpty's Egg Drop

The 40th game in 1K hires on the ZX81. This time again with a famous person. Humpty Dumpty made his entrance to the ZX81. Don't drop Humpty Dumpty.... Please let him land safely on the next platform. He is fragile.

```
; Humpty Dumpty's Egg Drop
; Controls
; Start = Newline
; Left  = 1-5
; Right = 6-0

? * TORNADO *

height     EQU  168-64

           ORG  #4009             ;#4009
           DUMP 49161

basic      LD   B,0               ; line number but also code
           JR   init0             ; length

           DEFB 236,212,28        ; GOTO USR 0
           DEFB 126
           DEFB 143,0,18          ; shortest FP-number of #4009

nline      DEFW last              ; NEEDED for loading
chadd      DEFW last-1
xptr       DEFW 0
stkbot     DEFW last
stkend     DEFW last
```

```
berg       DEFB 0
mem        DEFW 0                  ; not needed without fp
           DEFB 128

init1      JP   init

lastk      DEFB 255,255,255        ; above reusable after loading
margin     DEFB 55

nxtlin     DEFW basic              ; NEEDED for loading only

init0      XOR  A                  ; start 48K bugfix
           DEFB 254                ; CP n, skip flagx
flagx      DEFB 0
           JR   init1              ; continue

taddr      DEFW 3213               ; used by ZX

           DEFB 0
           DEFB 0

frames     DEFW 65535              ; unusable block
coords     DEFB 0,0
prcc       DEFB 188
sposn      DEFB 33,24
cdflag     DEFB 64                 ; end unusable block

           DEFW 0,0                ; filler

; humpty dumpty graphics
; 1 start left leg
; 2 start right leg
; 3 second start left leg
; 4 second start right leg
; 5 first drop miss
; 6 second drop miss

hdudg1     DEFB 0,60,126,153,221,153
           DEFB 255,219,102,60,38,96,0
hdudg2     DEFB 0,60,126,153,187,153
           DEFB 255,219,102,60,100,6
           DEFB 0,0,0,0,0,0,0
hdudg3     DEFB 0,52,110,217,189,121
           DEFB 255,219,102,60,38,96,0
hdudg4     DEFB 0,52,110,217,187,121
           DEFB 255,219,102,60,100,6,0

hdudg5     DEFB 102,36,60,126,195,255
           DEFB 175,222,173,251,118,44
hdudg6     DEFB 203,163,202,170,0,231,60
           DEFB 126,190,221,235,118

hr         LD   HL,lowres+#8000    ; the lowres display
           LD   BC,#209
           LD   A,#1E
           LD   I,A
           LD   A,#FB
           CALL #2B5

           LD   B,7                ; sync hires display
hr00       DJNZ hr00
           LD   A,(HL)

           LD   HL,scrlines        ; the screen with platforms
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```
            LD   A,H
            LD   D,H
            LD   I,A               ; set high byte of hr-screen
            EXX
            LD   HL,scrudg         ; the Humpty-UDG screen
            LD   BC,#B10F          ; 176 lines +1

low         DEC  B                 ; on RET here NEVER to zero

lineloop    LD   A,B               ; check Humpty on screen
            CP   (HL)
            JR   NZ,testscr        ; test platform-display

doudg       INC  L                 ; display Humpty-udg
            LD   E,(HL)            ; fetch position of item
            INC  HL
            LDI                    ; copy item to LBUF
            LD   C,E               ; save "position" for erase
            LD   A,0               ; XOR A is too fast
            LD   R,A               ; set lowbyte
            JP   #C000             ; display the item

testscr     EXX
            CP   (HL)              ; check platform
            JR   NZ,doempty        ; no platform, empty line

doscr       INC  HL                ; display platformline
            LD   A,L
            LD   L,scrline2*256/256;pointer second line
            EXX
            LD   R,A
            JP   #C000             ; show platform

doempty     LD   A,7
delay       DEC  A                 ; timefill an empty line
            JR   NZ,delay

            EXX                    ; back to maintests

            LD   E,C               ; erase last printed item
            DEC  DE                ; from LDI 1 too far
            LD   (DE),A            ; erase for next item
            LD   (DE),A            ; timing
            INC  DE                ; timing

            DJNZ lineloop          ; LAST LINE EMPTY, only exit

            CALL #292              ; back from intrupt
            CALL #220
            LD   IX,hr
            JP   #2A4

doline      LD   A,(HL)            ; get X on line
            AND  #1F               ; 0 - 31
            DEFB #CA               ; JP C never true
undo        ADD  A,14
            SUB  7                 ; 31-3-3 line=28 platform=3
            JR   C,undo            ; original less than 6
            INC  A                 ; at least 1
            LD   (DE),A            ; save X-position
            RET

cls         LD   BC,#3C00          ; clear all previous platforms
            LD   HL,scrlines
```

```
cls1        LD   (HL),C
            INC  HL
            DJNZ cls1
            RET

eogtest     JR   NZ,nextloop       ; end of game jump

            LD   BC,5              ; Game over, test hiscore
            LD   DE,hiscore-1
            LD   HL,score-1
fihi        INC  HL
            INC  DE
            DEC  C
            JR   Z,start
            LD   A,(DE)
            CP   (HL)
            JR   Z,fihi
            JR   NC,start
            LDIR

start       LD   A,%10111111       ; game over, wait for
            IN   A,(254)
            RRA                    ; newline
            JR   C,start

loadstart   LD   HL,0
            LD   (strom+1),HL      ; reset ROM start

            LD   HL,#1C1C          ; reset score
            LD   (score),HL
            LD   (score+2),HL

nextloop    CALL cls               ; dropped Humpty, restart

            LD   HL,init0
            LD   (HL),1            ; set dx line 1
            INC  HL
            LD   (HL),255          ; opposite move line 2

strom       LD   HL,0              ; startline in ROM, increases
            LD   DE,xlines+1
            CALL doline            ; set first line

            LD   A,(DE)
            LD   (yplay+2),A       ; Humpty Dumpty platform X

            INC  DE
            INC  HL

botlinein   CALL doline            ; set second or new line

            LD   A,height
            LD   (platformy+1),A
            ADD  A,12
            LD   (yplay+1),A       ; Humpty Dumpty platform Y

; built screen
platformy   LD   E,height
            LD   D,2
xlines      LD   BC,#0202
            LD   A,B               ; swap needed
            LD   B,C
            LD   C,A
            LD   HL,scrlines
```

```
xline2     LD   (HL),E
           XOR  A
clline     INC  HL
           LD   (HL),A            ; clear before platform
           DJNZ clline
           LD   B,C               ; save second x position
           DEC  A                 ; now 255
           LD   (HL),A
           INC  HL
           LD   (HL),A
           INC  HL
           LD   (HL),A            ; 3 positions platform
           INC  HL
           INC  A
           LD   (HL),A            ; erase 3x after platform
           INC  HL
           LD   (HL),A
           INC  HL
           LD   (HL),A
           LD   L,scrline2*256/256
           LD   A,E               ; second line data
           SUB  64
           LD   E,A
           DEC  D
           JR   NZ,xline2         ; do second line

           LD   BC,(udg1+1)       ; get current Humpty pointer
yplay      LD   DE,#600           ; y and x of player
           LD   HL,scrudg         ; the screen part of Humpty

sus        PUSH HL                ; save screenposition
           LD   HL,scrlines
           LD   A,E               ; on same line 1st platform?
           CP   (HL)
           JR   Z,onscreen        ; if so set on that line
           LD   L,scrline2*256/256
           CP   (HL)              ; second platform?
           JR   Z,onscreen        ; do the same
           POP  HL                ; get screenposition

setscrudg  LD   (HL),E            ; Y of udg Humpty
           INC  HL
           LD   (HL),D            ; X of humpty
           INC  HL
           LD   A,(BC)
           LD   (HL),A            ; the UDG data of Humpty
           INC  HL
           JR   nudgline

onscreen   LD   A,L
           ADD  A,D
           LD   L,A
           INC  HL                ; calculate screen X
           LD   A,(BC)
           LD   (HL),A            ; write directly
           POP  HL                ; retrieve screenposition

nudgline   LD   (HL),E            ; impossible next line
           DEC  E                 ; next udg line
           INC  BC
           LD   A,(BC)
           OR   A                 ; test end of Humpty UDG-data
           JR   NZ,sus            ; set UDG on screen
```

```
udg1        LD   HL,hdudg1
            LD   A,L
            XOR  #0D
            LD   L,A
            LD   (udg1+1),HL       ; swap feet and eyes

            LD   HL,frames         ; delay for playable game
            LD   A,(HL)
            SUB  10
wfr         CP   (HL)
            JR   NZ,wfr

            LD   HL,xlines+2       ; x storage
            LD   DE,init0          ; dx storage
            LD   A,2
            LD   (noplat+1),A      ; not on platform count
            LD   B,A
domove      LD   A,(DE)            ; get dx
            ADD  A,(HL)            ; add xpos
            LD   C,A               ; save new
            SUB  2
            CP   25                ; <0 or >25 is swap
            JR   C,setnewx
            LD   A,(DE)            ; swap direction
            NEG
            LD   (DE),A
            JR   domove            ; move again other way around

setnewx     LD   A,(yplay+2)       ; get player x
            SUB  (HL)              ; test against old x platform
            LD   (HL),C            ; set new x
            INC  A
            CP   3
            JP   NC,noplat         ; not on platform for x

            LD   A,(platformy+1)   ; X on platform, now test Y
            DEC  B
            JR   Z,plat2           ; test top/bottom platform
            SUB  64                ; calculate lower platform
plat2       ADD  A,12
            INC  B                 ; undo djnz
            LD   C,A
            LD   A,(yplay+1)       ; player y
            CP   C
            JR   NZ,noplat         ; no match, not on platform

; movement only allowed on platforms
            LD   C,0               ; total sum dx
            LD   A,(lastk)
            CP   %11110111         ; 1-5
            JR   NZ,right          ; test left
            DEC  C                 ; move left
right       CP   %11101111         ; 6-0
            JR   NZ,platdir        ; test right
            INC  C                 ; move right

platdir     LD   A,(yplay+2)       ; get x
            EX   DE,HL
            ADD  A,(HL)            ; add platform movement
            ADD  A,C               ; add dx
            EX   DE,HL
            LD   (yplay+2),A       ; save new x
            LD   A,(yplay+1)
            CP   height-64+12      ; test landed on bottom
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```
            JR   NZ,onplat          ; continue if not

; now on bottom platform, lift up
lift        LD   HL,frames
            LD   A,(HL)
wflift      CP   (HL)
            JR   Z,wflift
            LD   B,12               ; 12 lines of Humpty graphic
            LD   HL,scrudg
upudg       INC  (HL)               ; 2 lines up
            INC  (HL)
            INC  HL
            INC  HL
            INC  HL
            DJNZ upudg              ; do full Humpty up
            LD   A,(scrlines)       ; get Y platform 1
            ADD  A,2
            LD   (scrlines),A       ; add 2
            SUB  64
            LD   (scrline2),A       ; also second platform up
            CP   height             ; repeat until bottom on top
            JR   NZ,lift

            LD   HL,score+4         ; now add a point
            DEFB 1                  ; hide "ten"
ten         LD   (HL),28
            DEC  HL
            INC  (HL)               ; add a point
            LD   A,(HL)
            CP   38                 ; > "9" ?
            JR   Z,ten

            CALL cls                ; clear platforms

            LD   HL,(strom+1)       ; STart ROM
            INC  HL
            LD   (strom+1),HL       ; next ROM-pointer
            PUSH HL

            LD   HL,init0+1         ; data bottom dx to top
            CALL swap

            LD   HL,xlines+2        ; data bottom x to top
            CALL swap
            EX   DE,HL
            POP  HL
            JP   botlinein          ; add a new line

swap        LD   C,(HL)
            DEC  HL
            LD   A,(HL)
            LD   (HL),C
            INC  HL
            LD   (HL),A
            RET

noplat      LD   A,0                ; count the times on platform
            DEC  A
            LD   (noplat+1),A

onplat      DEC  HL
            INC  DE

            DEC  B
```

```
           JP   NZ,domove

droptest   LD   A,(noplat+1)
           OR   A
           JR   NZ,nodrop         ; not zero, then on a platform

           LD   A,(yplay+2)       ; test remains of Humpty
           ADD  A,scrline2*256/256
           INC  A
           LD   L,A
           LD   H,scrlines/256
           LD   A,(HL)
           INC  A
           JR   Z,skiperase       ; do not erase platform
           LD   (HL),0            ; erase possible remains
skiperase  LD   A,(yplay+1)
           SUB  8                 ; drop 8 lines
           CP   14
           LD   (yplay+1),A
           JR   C,droppedhd       ; test bottom hit

nodrop     JP   platformy

droppedhd  LD   HL,hdudg6         ; alter dropped Humpty UDG
           LD   A,L
           XOR  #FC
           LD   L,A
           LD   (droppedhd+1),HL
           LD   DE,scrudg+2       ; copy dropped UDG to screen
           LD   BC,#0CFF
copy       LDI
           INC  DE
           INC  DE
           DJNZ copy

           LD   HL,frames         ; show dropped Humpty
           LD   A,(HL)            ; for some time
           SUB  80
wdead      CP   (HL)
           JR   NZ,wdead

liveloop   LD   A,hdudg1*256/256  ; alter to next humpty
           XOR  32
           LD   (udg1+1),A
           LD   (liveloop+1),A
           CP   hdudg1*256/256    ; second drop resets
           JP   eogtest

space      EQU  #4300-$
           DEFS space

           DEFB 0
lbuf       DEFW 0,0,0,0,0,0,0
           DEFW 0,0,0,0,0,0,0

; 3 lines for platforms, y,nl,28 bytes
scrlines   JP   low               ; start of platformlines

init       LD   IX,hr             ; Hires mode
           LD   SP,#4300          ; SP in game, not at end
           EX   AF,AF'            ; delay intrupt

           LD   HL,lbuf           ; linebuffer over sysvar
           LD   DE,#4000
```

```
            LD   C,31               ; this copy needed
            LDIR                    ; before 48K repair

            LD   L,C                ; 0
            LD   H,D                ; HL = #4000
            LD   E,L
            LD   D,#C0              ; DE = #c000
            LD   B,4                ; BC = #400
            LDIR                    ; repair 48K bug
            NOP

scrline2    JP   loadstart
            DEFS 30

; final byte as fake marker

x           EQU  101

            DEFB 118
lowres      DEFB 118
score       DEFB 28,28,28,28,0
            DEFB "H"+x,"U"+x,"M"+x,"P"+x,"T"+x,"Y"+x,128
            DEFB "D"+x,"U"+x,"M"+x,"P"+x,"T"+x,"Y"+x,150
            DEFB "E"+x,"G"+x,"G"+x,128,"D"+x,"R"+x,"O"+x,"P"+x
            DEFB 0
hiscore     DEFB 28,28,28,28
            DEFB 118

scrudg      EQU  $                 ; Hires Humpty screen

vars        DEFB 128
?
last        EQU  $
```