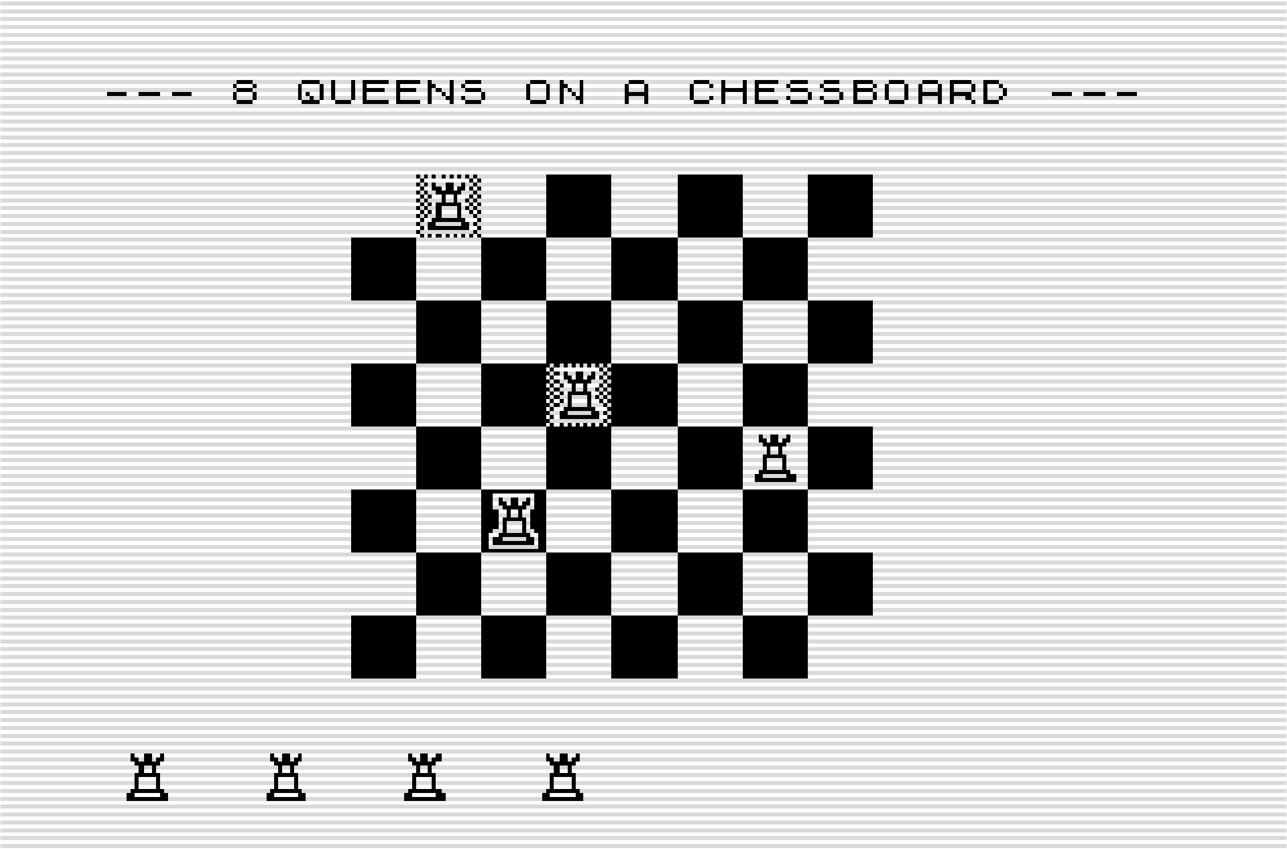
Queens



--- 8 QUEENS ON A CHESSBOARD ---

This classic puzzle only needed a good display that would do the job. On CITY ESCAPE 2 graphics were shown on 5 fields. I need 8 fields in a row here, but I don't need 2 graphics. With the display of CITY ESCAPE as base I could code the display of QUEENS. The game itself was easy to code, enough room left so no optimizations done or needed.

```
; 8 queens
; place 8 queens on a chessboard without attack

? * TORNADO *

           ORG  #4009             ;#4009
           DUMP 49161

qow        EQU  udgs*256/256
qob        EQU  qow+32
erq        EQU  qob+32
fb         EQU  fakeboard*256/256

basic      LD   B,3
L400B      JR   init0

           DEFB 236
           DEFB 212,28,126
           DEFB 143,0,18

eline      DEFW last
chadd      DEFW last-1
xptr       DEFW 0
stkbot     DEFW last
stkend     DEFW last
berg       DEFB 0
mem        DEFW 0                 ; not needed without fp
```

```
init1       EX   AF,AF'
            JP   init

lastk       DEFB 255,255,255
margin      DEFB 55

nxtlin      DEFW basic

init0       XOR  A
qcnt        DEFB 254

flagx       DEFB 0

strlen      JR   init1

taddr       DEFW 3213
seed        DEFW 0
frames      DEFW 65535
coords      DEFB 0,0
prcc        DEFB 188
sposn       DEFB 33,24
cdflag      DEFB 64


hr          LD   HL,dfile+#8000
            LD   BC,#401
            LD   A,#1E
            LD   I,A
            LD   A,#FA
            CALL #2B5              ; lowres screen

            LD   BC,scrdata-2
            EXX
            LD   E,#10
            LD   HL,#4380          ; the board
            LD   A,H
            LD   I,A

            LD   B,6
hr0         DJNZ hr0

            CALL hrentry           ; set the board


            LD   B,13
hr1         DJNZ hr1
            LD   A,(HL)

            LD   D,2
dloop       LD   B,E
            LD   A,qow-2
sh8         INC  A
            INC  A
q8          CALL show8             ; show remaining queens
            PUSH HL
            POP  HL
            DEC  B
            JP   NZ,sh8

            LD   HL,q8+2
            LD   A,#80
            XOR  (HL)
            LD   (HL),A
```

```
           DEC  D
           JR   NZ,dloop

           CALL #292
           CALL #220
           LD   IX,hr
           JP   #2A4

show8      LD   R,A
           DEFW 0
           LD   R,A
           DEFW 0
           LD   R,A
           DEFW 0
           LD   R,A
           DEFW 0
           LD   R,A
           DEFW 0
           LD   R,A
           DEFW 0
           LD   R,A
           DEFW 0
           LD   R,A
           DEFW 0
show8end   RET  P                 ; always true

cloop      ADD  A,E               ; calc next boardline
           LD   L,A               ; save it
           NOP                    ; timing
           RET  Z                 ; next highbyte is exit

hrentry    LD   B,E               ; 16 lines per boardline
           EXX
           INC  BC
           LD   A,(BC)            ; get UDG-pointer
           LD   H,udgs/256        ; make address
           LD   L,A
           DEC  BC

bloop      LD   A,(BC)            ; get fieldposition
           LD   D,H               ; set highbyte right
           LD   E,A
           LDI                    ; copy udg to board
           LDI                    ; size 16 pixels

           EXX
           DEC  B                 ; decrease linecounter
           LD   A,L               ; get datapointer
           JP   lbuf+#8000        ; do display

lbuf       LD   R,A
           DEFW 0,0,0,0
           DEFW 0,0,0,0
           JP   Z,cloop           ; calc next line
           EXX
           JP   blow

blow       PUSH HL                ; timing
           POP  HL
           INC  C                 ; undo old line
           INC  C
           JR   bloop             ; do same udg again
```

```
; the data to display the queens
           DEFB 0
endscr     DEFB fb,erq*256/256,fb
           DEFB qob*256/256,fb
           DEFB qow*256/256,fb
           DEFB erq*256/256,fb
           DEFB qob*256/256,fb
           DEFB qob*256/256,fb
           DEFB qow*256/256,fb
           DEFB qow*256/256
scrdata    EQU  $

field      LD   A,B
           AND  7
           LD   B,A
           LD   A,C
           AND  7
           LD   C,A
           PUSH BC
           INC  B
           INC  C
           LD   H,#43
           LD   A,#80-2-16
           ADD  A,C
           ADD  A,C
ffield     ADD  A,16
           DJNZ ffield
           LD   L,A
           POP  BC
           RET

qfind      LD   BC,scrdata-2
fqueen     LD   A,(BC)
           CP   L
           RET  Z                 ; found

nextq      DEC  BC
           DEC  BC
           LD   A,C
           CP   endscr*256/256-1
           RET  C                 ; not on board
           JR   fqueen

dlrs       DEFB 0,"D"-k,"L"-k,"R"-k,"F"-k,0

start      LD   HL,dlrs
redef      LD   A,(lastk)
           INC  A
           JR   NZ,redef          ; wait for keyup
redef1     LD   BC,(lastk)
           LD   A,C
           INC  A
           JR   Z,redef1          ; wait for keydown
           PUSH HL
           CALL #7BD              ; translate key
           POP  HL
           LD   (HL),A            ; save keycode
           INC  HL
           LD   A,(HL)
           LD   (dir),A           ; show next keyread
           OR   A                 ; test on end
           JR   NZ,redef
           JR   restart
```

```
won        LD   HL,text-1
shift      INC  HL
           PUSH HL
           LD   DE,message
           LD   BC,32
           LDIR
           LD   HL,frames
           LD   A,(HL)
           SUB  10
wf3        CP   (HL)
           JR   NZ,wf3
           POP  HL
           LD   A,(HL)
           CP   endtext*256/256
           JR   NZ,shift

restart    LD   HL,scrdata-2
           LD   DE,show8+2
           LD   B,8
           LD   A,B
           LD   (qcnt),A
           XOR  A
cls        LD   (HL),fb
           LD   (DE),A
           INC  DE
           LD   (DE),A
           INC  DE
           INC  DE
           INC  DE
           DEC  HL
           DEC  HL
           DJNZ cls

           LD   C,B

gameloop   LD   E,8               ; 8 rows
           LD   SP,fakeboard      ; just reset the stack each loop
           LD   HL,scrdata-2

resq       LD   A,(HL)            ; get position on row
           BIT  1,A               ; odd position on row?
           JR   Z,noxor
           XOR  16                ; transfer to bit 4
noxor      AND  16                ; get bit 4 only
           ADD  A,A               ; make it 0 / 32
           ADD  A,qow             ; add udg queen on white
           INC  HL
           LD   (HL),A            ; set udg back
           DEC  HL
           DEC  HL
           DEC  HL
           DEC  E
           JR   NZ,resq           ; do full board

           LD   A,(qcnt)          ; test here so
           OR   A                 ; all queens are shown
           JR   Z,won             ; ok on the board

           LD   E,2
flloop     CALL field
           PUSH BC
           CALL qfind
           INC  BC                ; when not found
           LD   A,(BC)
           XOR  96                ; fake position is flashed, no problems
           LD   (BC),A
           POP  BC

           PUSH HL
           LD   A,(HL)
           CPL
           LD   (HL),A
           INC  L
           LD   (HL),A

           LD   HL,frames
           LD   A,(HL)
           SUB  5
wfr        CP   (HL)
           JR   NZ,wfr
           POP  HL

           DEC  E
           JR   NZ,flloop         ; flash on and flash off
           PUSH BC
           LD   BC,(lastk)
           LD   A,C
           INC  A
           CALL NZ,#7BD
           POP  BC
           LD   HL,dlrs
           CP   (HL)              ; up
           INC  HL
           JR   NZ,testd          ; test down
           DEC  B
testd      CP   (HL)              ; down
           INC  HL
           JR   NZ,testl
           INC  B
testl      CP   (HL)              ; left
           INC  HL
           JR   NZ,testr
           DEC  C
testr      CP   (HL)              ; right
           INC  HL
           JR   NZ,testf
           INC  C
testf      SUB  (HL)              ; fire
           JR   NZ,gameloop

setqueen   LD   (erfnd+1),A       ; reset error
           LD   D,3
yloop      DEC  D
           DEC  D
           LD   E,3
xloop      DEC  E
           DEC  E

           PUSH BC
           LD   A,D
           OR   E
           JR   Z,outboard        ; no dy and no dx
onboard    CALL field
           PUSH BC
           CALL qfind
           JR   NZ,step           ; no queen found
           INC  BC
           LD   A,erq             ; signal error queen
           LD   (BC),A
           LD   (erfnd+1),A
step       POP  BC                ; get x' and y'
           LD   A,B
           ADD  A,D               ; do dy
           LD   B,A
           LD   A,C
           ADD  A,E               ; do dx
           LD   C,A
           OR   B
           BIT  3,A               ; x or y out of board?
           JR   Z,onboard
outboard   POP  BC                ; get original x and y
           INC  E
           JR   NZ,xloop          ; not all dx done
           INC  D
           JR   NZ,yloop          ; not all dy done


           CALL field
           LD   A,L
           SUB  #80
           LD   DE,scrdata
pfield     DEC  DE
           DEC  DE
           SUB  16
           JR   NC,pfield

           LD   A,(DE)
           CP   fb
           JR   Z,erfnd           ; check error on empty line
           CP   L
           JR   Z,clearq          ; clear on same field

erfnd      LD   A,0
           OR   A
           JR   Z,setq

showerror  LD   HL,frames         ; 1 sec of current board
           LD   A,(HL)
           SUB  50
wf2        CP   (HL)
           JR   NZ,wf2
gl         JP   gameloop

setq       LD   A,L
           LD   (DE),A
           LD   HL,show8end+2
ferfld     DEC  HL
           DEC  HL
           DEC  HL
           LD   (HL),#40
           DEC  HL
           LD   A,(HL)
           OR   A
           JR   NZ,ferfld         ; find erasefield
           LD   (HL),#40

           LD   HL,qcnt
           DEC  (HL)

           JR   gl
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```
clearq     BIT  1,A              ; odd position on row?
           JR   Z,noxor2
           XOR  16               ; transfer to bit 4
noxor2     AND  16               ; get bit 4 only
           JR   Z,clhl
           LD   A,255
clhl       LD   (HL),A
           INC  HL
           LD   (HL),A
           LD   A,fb
           LD   (DE),A
           LD   HL,qcnt
           INC  (HL)


           LD   HL,show8-1
fsetfld    INC  HL
           INC  HL
           INC  HL
           XOR  A
           LD   (HL),A
           INC  HL
           CP   (HL)
           JR   Z,fsetfld
           LD   (HL),A
           JR   gl

text       DEFB 60,42,49,49,0,41,52,51,42,27 ; "WELL DONE."
           DEFB 0                ; " "
           DEFB 62,52,58,0,43,52,58,51,41,0 ; "YOU FOUND "
           DEFB 38,0,56,52,49,58,57,46,52,51 ; "A SOLUTION"
           DEFB 27,0,57,55,62,0,43,46,51,41 ; ". TRY FIND"
           DEFB 46,51,44,0,38,51,52,57,45 ; "ING ANOTH"
           DEFB 42,55,27         ; "ER."
           DEFB 118,118
endtext    DEFB 118


k          EQU  27
dfile      DEFB 118
           DEFB 22,22,22,0
           DEFB 36,0,"Q"-k,"U"-k,"E"-k,"E"-k,"N"-k,"S"-k,0
           DEFB "O"-k,"N"-k,0,"A"-k,0,"C"-k,"H"-k,"E"-k
           DEFB "S"-k,"S"-k,"B"-k,"O"-k,"A"-k,"R"-k,"D"-k
           DEFB 0,22,22,22
           DEFB 118
message    DEFW 0,0,0,0,0,0,0
           DEFB 0
dir        DEFB "U"-k
           DEFW 0,0,0,0,0,0,0,0
           DEFB 118,118
           DEFB 118,118

spa        EQU  #4380-98-$

           DEFS spa              ; Stack area and coding room

fakeboard  DEFW 0
; 2x udg
udgs       DEFB 0,0,0,0          ; queen on white
           DEFB 9,144,13,176
           DEFB 7,224,2,64
           DEFB 2,64,7,224
           DEFB 4,32,4,32
           DEFB 4,32,15,240
           DEFB 24,24,31,248
           DEFB 0,0,0,0

           DEFB 255,255,224,7      ; queen on black
           DEFB 233,151,237,183
           DEFB 231,231,242,79
           DEFB 242,79,247,239
           DEFB 244,47,244,47
           DEFB 228,39
           DEFB 207,243,216,27
           DEFB 223,251,192,3
           DEFB 255,255

           DEFB 170,170,64,5       ; error queen
           DEFB 169,146,77,181
           DEFB 167,226,82,69
           DEFB 162,74,87,229
           DEFB 164,42,84,37
           DEFB 164,34,79,241
           DEFB 152,26,95,249
           DEFB 128,2,85,85

w          EQU  0
n          EQU  65535

; 2 lines of board, rest is copied
board      DEFW w,n,w,n,w,n,w,n
           DEFW n,w,n,w,n,w,n,w

init       LD   IX,hr
           LD   SP,fakeboard
           LD   H,#3F
           LD   D,#BF
           LD   E,L
           LDIR

           LD   HL,start
           PUSH HL
           LD   HL,board
           LD   DE,init
           LD   C,96
           JP   #19F9

vars       DEFB 128
last       EQU  $
```