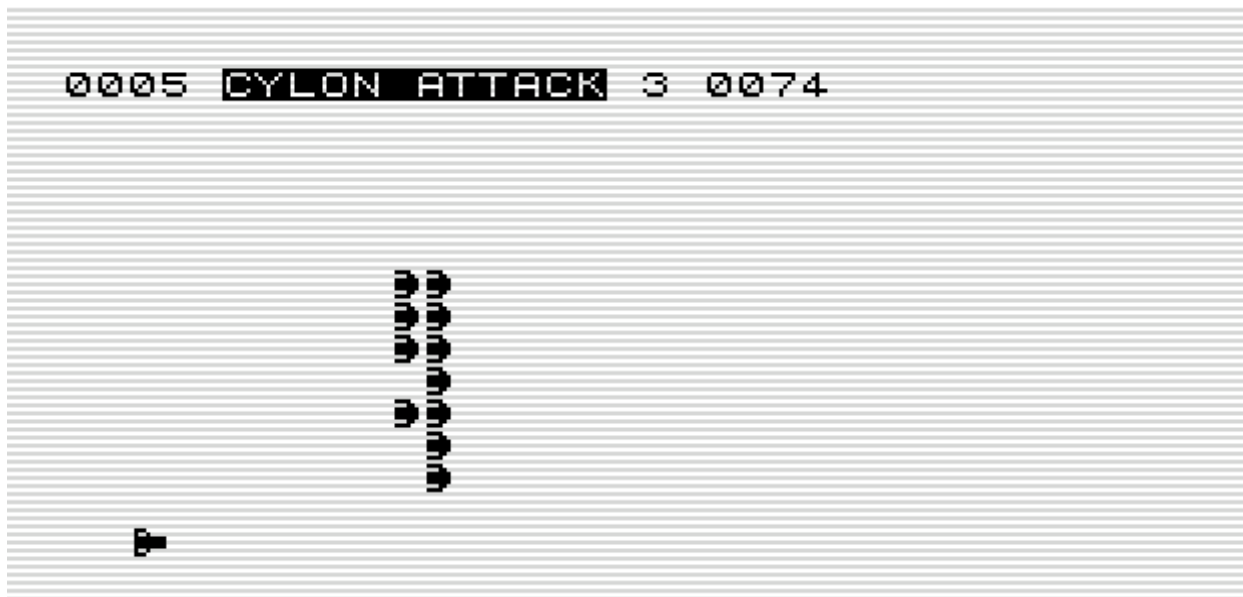# Cylon Attack

Some kind of SPACE INVADERS was always on my mind to try in 1K hires.
Easier said than done. Finally I turned the display and made it a horizontal invader.
Only 1 shot per line is possible, making it tough enough to play.

```
; Battlestar Galactica :Cylon attack
; Game 74 in 1K hires for the ZX81.

? * TORNADO *

lines       EQU  14
nrcylon     EQU  16

size        EQU  25
exit        EQU  #4011

field       EQU  nxtlin

            ORG  #4009                ;#4009
            DUMP 49161

; program starts here, both BASIC and machinecode
basic       EX   AF,AF'              ; delay intrupt,opcode no bit6
            LD   H,B                 ; preset for 48K bug to #40
            JR   init0               ; continue where room

            DEFB 236,212,28          ; The BASIC
            DEFB 126                 ; fully placed over sysvar
            DEFB 143,0,18            ; start BASIC=#4009 also MC

            DEFW last                ; needed by loading
chadd       DEFW last-1
xptr        DEFW 0
stkbot      DEFW last
stkend      DEFW last
berg        DEFB 0
mem         DEFW 0
            DEFB 128

            DEFB 0,0,0
```

```
        ; all above reusable AFTER loading

lastk      DEFB 255,255,255     ; used by ZX81
margin     DEFB 55              ; used by ZX81
nxtlin     DEFW basic           ; reusable after load

init0      DEFB 0,0,0,0         ; IX set AFTER lowres screen

           LD   E,L             ; DE now #xx.L

taddr      DEFW 0               ; used by ZX81 on LOAD only
                                ; unharmed code

           LD   B,4             ; copy >1K code

frames     DEFB #16+1           ; LD D,n , after LOAD -1
           DEFB #C0             ; highbyte must have bit 7 set
coords     LDIR                 ; DE now #C0.L  = Hl +#8000
                                ; fix 48K bug before display
prcc       JP   init            ; continue to mainprog

cdflag     DEFB 64              ; used by ZX81

; Place ANY code to fill up to #4040
low        LD   A,0
           LD   (BC),A
           DEC  E
           JP   Z,bloop         ; test end of 8 lines reached

cloop      LD   (low+1),A
           LD   A,(DE)
           LD   A,(DE)
           NOP
           LD   A,(DE)          ; get show/noshow fire
           LD   (BC),A          ; set fire signal
           DEC  DE
           LD   A,(DE)          ; get characterline
           LD   R,A             ; set lowbyte of hires
           JP   (IX)            ; show line through stack

; some lowres, HR must start AFTER #403F, but before #4070
hr         LD   HL,lowres+#8000 ; the lowres display
           LD   BC,#251         ; minimum needed #11
           LD   A,#1E
           LD   I,A
           LD   A,#FB
           CALL #2B5            ; show lowres screen

; the hr part
           LD   B,7
hr0        DJNZ hr0             ; sync hires with lowres
           LD   (exit+1),SP
           LD   SP,scrstack
           LD   HL,low          ; back from display
           LD   A,H
           LD   IX,lbuf-size-1+#8000
           LD   I,A             ; set highbyte display

; 207 tstates delay cheaper than line
; get fireposistion somehow

bloop      LD   DE,size+1       ; get fireposition
           ADD  IX,DE
```

```
                INC   DE
                LD    A,(HL)
                LD    B,4
linedelay       LD    DE,14+16384
                DJNZ  linedelay

                DEFB  #DD
                LD    A,L
                INC   A
                JR    Z,exit              ; test end of screen
                POP   BC
                LD    A,(BC)
                CP    #E9                 ; is fire on end of line
                JP    NZ,notbc
                DEFB  1                   ; if so, make BC in ROM
notbc           INC   E                   ; use BC from stack
                DEC   DE                  ; 10 tstates harmless sync code
                JR    cloop

delay           LD    A,252
                LD    HL,frames           ; standard delay routine
                ADD   A,(HL)
wfr             CP    (HL)
                JR    NZ,wfr
                RET

l1              DEFB  224
                DEFB  120,120,120,120,120,120
                DEFB  120,120,120,120,120,120
                DEFB  120,120,120,120,120,120
                DEFB  120,120,120,120,120,120

l2              DEFB  144
                DEFB  12,12,12,12,12,12
                DEFB  12,12,12,12,12,12
                DEFB  12,12,12,12,12,12
                DEFB  12,12,12,12,12,12

l3              DEFB  255
                DEFB  126,126,126,126,126,126
                DEFB  126,126,126,126,126,126
                DEFB  126,126,126,126,126,126
                DEFB  126,126,126,126,126,126

eog             LD    HL,score-1          ; your score
                LD    DE,hiscore-1        ; hiscore
                LD    BC,5                ; size 4
fihi            INC   HL
                INC   DE
                DEC   C                   ; when C=0
                LD    A,(DE)              ; (de) = #76
                CP    (HL)                ; (hl) = 0
                JR    Z,fihi              ; so not same
                CALL  C,#19F9             ; and no hiscore

start           LD    A,(lastk)           ; game over, wait for
                SUB   %10111111           ; newline
                JR    NZ,start

                LD    HL,score
clsco           LD    (HL),28             ; reset old score
                INC   HL
                CP    (HL)
                JR    NZ,clsco
```

```
                LD    A,32
                LD    (lives),A

dead            LD    HL,lives
                DEC   (HL)
                LD    A,(HL)
                CP    28
                JR    Z,eog

cls             LD    HL,lbuf-1          ; end of 1K RAM end of lbufs
                LD    SP,HL
                LD    DE,scrstack
                LD    B,8                ; 8 cylons on a row
clbuf           LD    A,(HL)
                CP    #E9
                JR    NZ,cllbuf
                LD    A,L
                LD    (DE),A
                INC   DE
                INC   DE
                DEC   B
                LD    C,258-size         ; 2! rows of cylons
                INC   HL
cllbuf          LD    (HL),#40           ; erase visible character
                LD    A,H                ; get value > 63
                CP    B
                JR    C,cldone           ; test all cylons on row done
                CP    C
                JR    C,cldone           ; test rows with cylons done
                LD    (HL),C             ; show cylon
cldone          INC   C
                INC   HL                 ; go to next field
                LD    A,H
                SUB   #44
                JR    NZ,clbuf           ; test end of screen reached
                LD    A,lines
                LD    (cylonline+1),A
                LD    A,size-2
                LD    (cylpos+1),A
                LD    A,nrcylon
                LD    (lastk-1),A

                LD    A,200
                CALL  delay+2            ; delay before new screen starts

player          LD    B,5                ; position of player

playloop        LD    HL,scrstack
                LD    C,14
fireup          LD    E,(HL)
                INC   HL
                LD    D,(HL)
                LD    A,(DE)
                ADD   A,A
                JR    C,skipfire
                ADD   A,A
                JR    NC,addp
                INC   DE
; test visible, then hit
                LD    A,(DE)
                CP    #40
                JR    Z,nohit
                JR    NC,nohit
```

```
addp         LD    A,#40
             LD    (DE),A
; score here
             PUSH  HL
             LD    HL,score+4
             DEFB  #3A
ten          LD    (HL),28
             DEC   HL
             INC   (HL)
             LD    A,(HL)
             CP    38
             JR    Z,ten
             LD    HL,lastk-1
             DEC   (HL)
             POP   HL
             JR    Z,cls

findend      INC   DE
             LD    A,(DE)
             ADD   A,A
             JR    NC,findend

nohit        LD    (HL),D
             DEC   HL
             LD    (HL),E
             INC   HL
skipfire     INC   HL
             DEC   C
             JR    NZ,fireup

             CALL  field

             LD    (HL),C              ; show player
             PUSH  HL
             PUSH  BC

cylonline    LD    B,14
cylpos       LD    C,0
             CALL  field
cont         LD    A,#40
             CP    (HL)
             INC   HL
             JR    NZ,leftstep
             CP    (HL)
             JR    NZ,leftstep

; up/down move
clp          PUSH  BC
             CALL  field

             LD    A,B
             ADD   A,250
             LD    DE,size+1
             JR    NC,blp
             LD    DE,65535-size

blp          PUSH  HL
             ADD   HL,DE
             LD    A,(HL)
             LD    (HL),#40
             POP   BC
             LD    (BC),A

cntlp        LD    A,lines-1
```

```
                DEC   A
                JR    NZ,wcnt
                LD    A,lines-1
wcnt            LD    (cntlp+1),A
                JR    NZ,blp


                POP   BC
                LD    A,(cylpos+1)
                CP    C
                INC   BC


                JR    Z,clp
                JR    show


scrstack        DEFW  lbuf-1
                DEFW  1*size+lbuf
                DEFW  2*size+lbuf+1
                DEFW  3*size+lbuf+2
                DEFW  4*size+lbuf+3
                DEFW  5*size+lbuf+4
                DEFW  6*size+lbuf+5
                DEFW  7*size+lbuf+6
                DEFW  8*size+lbuf+7
                DEFW  9*size+lbuf+8
                DEFW  10*size+lbuf+9
                DEFW  11*size+lbuf+10
                DEFW  12*size+lbuf+11
                DEFW  13*size+lbuf+12
                DEFW  14*size+lbuf+13


leftstep        LD    DE,lbuf+1
                LD    A,15
                LD    HL,cylonline+1
                SUB   (HL)
                LD    (HL),A
                LD    HL,cylpos+1
                DEC   (HL)


all             LD    H,D
                LD    L,E
                LD    BC,size-2
                INC   HL
                LD    A,C
                CP    (HL)
                LDIR
                LD    A,#40
                LD    (DE),A
                JP    NC,dead
                INC   DE
                INC   DE
                INC   E
                JR    NZ,all


show            CALL  delay                 ; show screen


                LD    BC,(lastk)
                LD    A,C
                INC   A
                CALL  NZ,#7BD
                POP   BC


                POP   HL
                LD    (HL),#40              ; erase player
```

```
            CP    25                  ; "p"
            JR    NZ,updown
            CALL  field
            INC   HL                  ; HL now start of fire
            LD    DE,scrstack-2
            LD    A,B
            ADD   A,A
            ADD   A,E
            LD    E,A
            EX    DE,HL
            PUSH  DE
            LD    E,(HL)
            INC   HL
            LD    D,(HL)
            LD    A,(DE)
            POP   DE
            CP    #E9
            JR    NZ,nofire
            LD    (HL),D
            DEC   HL
            LD    (HL),E
nofire      LD    A,H
updown      LD    E,B
            CP    10                  ; "q"
            JR    NZ,key2
            DEC   B
key2        CP    5                   ; "a"
            JR    NZ,testb
            INC   B
testb       LD    A,B
            DEC   A
            CP    14
            JR    C,okmove
            LD    B,E
okmove      JP    playloop

x           EQU   101
lowres      DEFB  118
score       DEFB  28,28,28,28,0
            DEFB  "C"+x,"Y"+x,"L"+x,"O"+x,"N"+x,128
            DEFB  "A"+x,"T"+x,"T"+x,"A"+x,"C"+x,"K"+x,0
lives       DEFB  28,0
hiscore     DEFB  28,28,35,32
            DEFB  118

lbsize      EQU   lines*size+lines

mark        EQU   #43FF-lbsize

space       EQU   mark-$-1
            DEFS  space


            JP    (HL)
lbuf        DEFW  0,0,0,0,0,0,0,0,0,0,0,0
            DEFB  0
            JP    (HL)

; during game this is screen. After loading this
; part of text and wait for newline is executed
init        LD    SP,lbuf-1          ; move SP
            LD    HL,scr2
            LD    (basic+3),HL

            LD    HL,cent
```

```
                LD    C,1

w2              SET   7,(HL)
w21             LD    A,L
                ADD   A,C
                LD    L,A
                BIT   7,(HL)
                JR    NZ,clbit
                XOR   A
                SUB   C
                LD    C,A
                JR    w21
clbit           RES   7,(HL)
                EX    DE,HL
                CALL  delay
                EX    DE,HL

                LD    A,(lastk)
                SUB   %10111111
                JR    NZ,w2
                EX    AF,AF'            ; delay intrupt for copy time

                LD    IX,hr

                LD    HL,detab          ; table for display lines
                LD    DE,#4001          ; set over sysvar
                LD    C,33              ; exitroutine HR too on sysvar
                LDIR

                LD    HL,fieldc         ; simple RND-routine
                LD    DE,nxtlin         ; also set over sysvar to
                LD    C,18              ; save bytes in codeable
                LDIR                    ; memory

                LD    HL,lbuf           ; first line of display
                LD    DE,init           ; second line of display
                LD    BC,#4400-init     ; fill rest of memory
                SCF
                JP    start-3           ; with LDIR from hiscore


fieldc          PUSH  BC
                LD    A,E
                LD    HL,lbuf-size-1
                LD    DE,size+1
lb1             ADD   HL,DE
                DEC   B
                DEFB  #DA               ; pos 11 JP C
                DEFW  65535
                JR    NZ,lb1
                ADD   HL,BC
                POP   BC
                RET

detab           DEFB  l1*256/256-2,64
                DEFB  l2*256/256-2,64
                DEFB  l3*256/256-2,64
                DEFB  l3*256/256-2,0
                DEFB  l3*256/256-2,64
                DEFB  l2*256/256-2,64
                DEFB  l1*256/256-2,64
                DEFW  0


; fixed end of HR-routine
```

```
exitc      LD   SP,0
           CALL #292              ; back from intrupt
           CALL #220
           LD   IX,hr
           JP   #2A4

n          EQU  27

scr2       DEFB 118

           DEFB "C"+x,"Y"+x,"L"+x,"O"+x,"N"+x,128
           DEFB "A"+x,"T"+x,"T"+x,"A"+x,"C"+x,"K"+x,118,118

           DEFB "B"+x,"A"+x,"L"+x,"T"+x,"A"+x,"R"+x,0
           DEFB "C"-n,"E"-n,"N"-n,"T"-n,"U"-n,"R"-n

           DEFB "I"-n,"O"-n,"N"-n,26,118

           DEFB "A"-n,"T"-n,"T"-n,"A"-n,"C"-n,"K"-n,0
           DEFB "T"-n,"H"-n,"E"-n,0,"G"-n,"A"-n,"L"-n
           DEFB "A"-n,"C"-n,"T"-n,"I"-n,"C"-n,"A"-n,0

           DEFB "W"-n,"I"-n,"T"-n,"H"-n,118
           DEFB 29,34,0,"R"-n,"A"-n,"I"-n,"D"-n,"E"-n
           DEFB "R"-n,"S"-n,0,"I"-n,"N"-n,0,"W"-n,"A"-n
           DEFB "V"-n,"E"-n,"S"-n,118

           DEFB "A"-n,"N"-n,"D"-n,0,"Y"-n,"O"-n,"U"-n,0
           DEFB "W"-n,"I"-n,"L"-n,"L"-n,0
           DEFB "S"-n,"U"-n,"C"-n,"C"-n,"E"-n,"E"-n,"D"-n,118
           DEFB 118

cent       DEFB "C"+x,"E"+x,"N"+x,"T"+x,"U"+x,"R"+x
           DEFB "I"+x,"O"+x,"N"+x,0

           DEFB "B"-n,"Y"-n,0,"Y"-n,"O"-n,"U"-n,"R"-n,0
           DEFB "C"-n,"O"-n,"M"-n,"M"-n,"A"-n,"N"-n
           DEFB "D"-n,118

           JP   (HL)

vars       DEFB 128
last       EQU  $
```