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seg001:43E9 3C 2D 2D 2D+a20Points:.text "<---- 20 POINTS"
seg001:43FB 09 9E 3E .db 9, 9Eh, 3Eh
seg001:43FE 3C 2D 2D 2D+a10Points:.text "<---- 10 POINTS"
seg001:4410 09 1E 3F .db 9, 1Eh, 3Fh
seg001:4413 3C 2D 2D 2D+a_Mystery:.text "<---- ? MYSTERY"
seg001:4413 2D 20 20 20+ .db 0
seg001:4427 50 52 45 53+aPressZKeyToMov:.text "PRESS "
seg001:4427 53 20 22 5A+ .db 22h
seg001:4427 22 20 4B 45+ .text "Z"
seg001:4427 59 20 54 4F+ .db 22h
seg001:4427 20 4D 4F 56+ .text " KEY TO MOVE LEFT"
seg001:4441 09 13 3D .db 9, 13h, 3Dh
seg001:4444 50 52 45 53+aPressXKeyToMov:.text "PRESS "
seg001:4444 53 20 22 58+ .db 22h
seg001:4444 22 20 4B 45+ .text "X"
seg001:4444 59 20 54 4F+ .db 22h
seg001:4444 20 4D 4F 56+ .text " KEY TO MOVE RIGHT"
seg001:445F 09 93 3D .db 9, 93h, 3Dh
seg001:4462 50 52 45 53+aPressKeyToFire:.text "PRESS "
seg001:4462 53 20 22 20+ .db 22h
seg001:4462 22 20 4B 45+ .text " "
seg001:4462 59 20 54 4F+ .db 22h
seg001:4462 20 46 49 52+ .text " KEY TO FIRE !"
seg001:4479 09 13 3E .db 9, 13h, 3Eh
seg001:447C 50 52 45 53+aPressRKeyToSta:.text "PRESS "
seg001:447C 53 20 22 52+ .db 22h
seg001:447C 22 20 4B 45+ .text "R"
seg001:447C 59 20 54 4F+ .db 22h
seg001:447C 20 53 54 41+ .text " KEY TO START"
seg001:447C 52 54 00 .db 0
seg001:4493 47 20 41 20+aGAMEOVER:.text "G A M E - O V E R" ; DATA XREF: seg001:494B|o
seg001:4493 4D 20 45 20+ .db 0
seg001:44A5 20 20 53 43+aScore00000High:.text " SCORE 00000 HIGH-SCORE"
seg001:44A5 4F 52 45 20+ ; DATA XREF: seg001:4544|o
seg001:44A5 20 30 30 30+ .text " 00000"
seg001:44A5 30 30 20 20+ .db 0
seg001:44E5
; SUBROUTINE
seg001:44E5
seg001:44E5
seg001:44E5
seg001:44E5 C5
display_message: ; CODE XREF: seg001:4547|p
; seg001:455B|p ...
seg001:44E5
push bc
seg001:44E6
loc_0_44E6: ; CODE XREF: display_message+15|j
ld a, (hl) ; get character
or a ; finished?
jr z, loc_0_4503 ; yes, exit
cp 1
jr nz, loc_0_44FC
ld b, 5 ; 5 characters to print
ld a, 8 ; backspace
seg001:44F2
loc_0_44F2: ; CODE XREF: display_message+12|j
push de
seg001:44F2 D5
call 33h ; display character
seg001:44F3 CD 33 00
pop de
seg001:44F6 D1
djnz loc_0_44F2 ; loop
seg001:44F9
loc_0_44F9: ; CODE XREF: display_message+1C|j
inc hl ; next character
seg001:44F9 23
jr loc_0_44E6 ; loop
seg001:44FA 18 EA
;
seg001:44FC
loc_0_44FC: ; CODE XREF: display_message+7|j
push de
seg001:44FC D5
call 33h ; display character
seg001:44FD CD 33 00
pop de
seg001:4501 18 F6
jr loc_0_44F9 ; loop
;
seg001:4503
loc_0_4503: ; CODE XREF: display_message+3|j
pop bc
seg001:4503 C1
ret
seg001:4504 C9
; End of function display_message
seg001:4504
; SUBROUTINE
seg001:4505
seg001:4505
seg001:4505
seg001:4505
seg001:4505
seg001:4505
display_message_slowly: ; CODE XREF: display_message_slowly+11|j
; seg001:494E|p
ld a, (hl) ; get character
or a ; done?
ret z ; yes, exit
seg001:4506 B7
push de
seg001:4507 C8
push bc
seg001:4508 D5
call 33h ; display character
seg001:4509 C5
ld bc, 2300h ; ~130ms
seg001:450A CD 33 00
call 60h ; delay
seg001:450D 01 00 23
pop bc
seg001:4510 CD 60 00
pop de
seg001:4513 C1
pop bc
seg001:4514 D1
inc hl ; next character
seg001:4515 23
jr display_message_slowly ; loop through message
seg001:4516 18 ED
; End of function display_message_slowly
seg001:4516
; SUBROUTINE
seg001:4518
seg001:4518
seg001:4518
seg001:4518
seg001:4518 D9
wipe_screen_left_to_right_slow: ; CODE XREF: seg001:454F|p
; seg001:455A|p ...
exx
seg001:4519 21 FF 3B
ld hl, 3BFFh ; start of video (-1)
ld b, 40h ; '@' ; characters/line
seg001:451E
loc_0_451E: ; CODE XREF: wipe_screen_left_to_right_slow+19|j
push bc
seg001:451E C5
inc hl ; next column
seg001:451F 23
push hl
seg001:4520 E5
ld b, 0Fh ; 15 lines
seg001:4521 06 0F
ld a, 20h ; ' ' ; space
seg001:4523 3E 20
ld de, 40h ; '@' ; next line address
seg001:4525 11 40 00
seg001:4528
loc_0_4528: ; CODE XREF: wipe_screen_left_to_right_slow+12|j
ld (hl), a ; display character
seg001:4528 77

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seg001:45F8      ; -----
seg001:45F8      loc_0_45F8:      ; CODE XREF: sub_0_45E2+E|j
seg001:45F8      ld      a, 20h ; ' '
seg001:45FA      jr      loc_0_45EB
seg001:45FA      ; End of function sub_0_45E2
seg001:45FA
seg001:45FC      ; [REDACTED] S U B R O U T I N E [REDACTED]
seg001:45FC
seg001:45FC      sub_0_45FC:      ; CODE XREF: sub_0_4B48+2B|p
seg001:45FC      ; seg001:4B91|p
seg001:45FC      push     hl
seg001:45FD      push     bc
seg001:45FE      ld      hl, (word_0_4302)
seg001:4601      ld      b, 3Fh ; '?'
seg001:4603      loc_0_4603:      ; CODE XREF: sub_0_45FC+10|j
seg001:4603      ld      a, (hl)
seg001:4604      bit      7, a
seg001:4606      jr      z, loc_0_460B
seg001:4608      xor      0Fh
seg001:460A      ld      (hl), a
seg001:460B      loc_0_460B:      ; CODE XREF: sub_0_45FC+A|j
seg001:460B      inc      hl
seg001:460C      djnz     loc_0_4603
seg001:460E      push     de
seg001:460F      ld      hl, (word_0_4304)
seg001:4612      call     sub_0_4625
seg001:4615      ld      hl, (word_0_4306)
seg001:4618      call     sub_0_4625
seg001:461B      ld      hl, (word_0_4308)
seg001:461E      call     sub_0_4625
seg001:4621      pop      de
seg001:4622      pop      bc
seg001:4623      pop      hl
seg001:4624      ret
seg001:4624      ; End of function sub_0_45FC
seg001:4624
seg001:4625      ; [REDACTED] S U B R O U T I N E [REDACTED]
seg001:4625
seg001:4625      sub_0_4625:      ; CODE XREF: sub_0_45FC+16|p
seg001:4625      ; sub_0_45FC+1C|p ...
seg001:4626      push     hl
seg001:4628      ld      b, 40h ; '@'
seg001:4628      loc_0_4628:      ; CODE XREF: sub_0_4625+15|j
seg001:4628      ld      a, (hl)
seg001:4629      cp      8Ch ; 'i'
seg001:462B      jr      z, loc_0_4636
seg001:462D      cp      83h ; 'a'
seg001:462F      jr      nz, loc_0_4639
seg001:4631      ld      a, 8Ch ; 'i'
seg001:4633      ld      (hl), a
seg001:4634      jr      loc_0_4639
seg001:4636      ; -----
seg001:4636      loc_0_4636:      ; CODE XREF: sub_0_4625+6|j
seg001:4636      ld      a, 83h ; 'a'
seg001:4638      ld      (hl), a
seg001:4639      loc_0_4639:      ; CODE XREF: sub_0_4625+A|j
seg001:4639      ; sub_0_4625+F|j
seg001:4639      inc      hl
seg001:463A      djnz     loc_0_4628
seg001:463C      pop      hl
seg001:463D      ret
seg001:463D      ; End of function sub_0_4625
seg001:463D
seg001:463E      ; [REDACTED] S U B R O U T I N E [REDACTED]
seg001:463E
seg001:463E      sub_0_463E:      ; CODE XREF: sub_0_4888+14|p
seg001:463E      ; sub_0_48F6+2A|p ...
seg001:463E      push     hl
seg001:463F      ld      de, 3Eh ; '>'
seg001:4642      add     hl, de
seg001:4643      push     hl
seg001:4644      pop      de
seg001:4645      inc     de
seg001:4646      ld      b, 3Fh ; '?'
seg001:4648      ld      a, (de)
seg001:4649      bit      7, a
seg001:464B      jr      z, loc_0_4650
seg001:464D      ld      a, 20h ; ' '
seg001:464F      ld      (de), a
seg001:4650      loc_0_4650:      ; CODE XREF: sub_0_463E+D|j
seg001:4650      ; sub_0_463E+1C|j
seg001:4650      bit      7, (hl)
seg001:4652      jr      z, loc_0_4658
seg001:4654      ld      a, (hl)
seg001:4655      ld      (de), a
seg001:4656      ld      (hl), 20h ; ' '
seg001:4658      loc_0_4658:      ; CODE XREF: sub_0_463E+14|j
seg001:4658      dec     hl
seg001:4659      dec     de
seg001:465A      djnz     loc_0_4650
seg001:465C      pop      hl
seg001:465D      ld      (hl), 20h ; ' '
seg001:465F      ret
seg001:465F      ; End of function sub_0_463E
seg001:465F
seg001:4660      ; [REDACTED] S U B R O U T I N E [REDACTED]
seg001:4660
seg001:4660      sub_0_4660:      ; CODE XREF: sub_0_4888+2B|p
seg001:4660      ; sub_0_48F6+32|p ...
seg001:4660      push     hl

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seg001:4661 E5      push    hl
seg001:4662 D1      pop     de
seg001:4663 23      inc     hl
seg001:4664 06 3F    ld      b, 3Fh ; '?'
seg001:4666 1A      ld      a, (de)
seg001:4667 CB 7F    bit     7, a
seg001:4669 28 03    jr      z, loc_0_466E
seg001:466B 3E 20    ld      a, 20h ; ' '
seg001:466D 12      ld      (de), a
seg001:466E
loc_0_466E:
; CODE XREF: sub_0_4660+9|j
; sub_0_4660+18|j
seg001:466E CB 7E    bit     7, (hl)
seg001:4670 28 04    jr      z, loc_0_4676
seg001:4672 7E      ld      a, (hl)
seg001:4673 12      ld      (de), a
seg001:4674 36 20    ld      (hl), 20h ; ' '
seg001:4676
loc_0_4676:
; CODE XREF: sub_0_4660+10|j
seg001:4676 23      inc     hl
seg001:4677 13      inc     de
seg001:4678 10 F4    djnz   loc_0_466E
seg001:467A E1      pop     hl
seg001:467B 11 3F 00    ld      de, 3Fh ; '?'
seg001:467E 19      add     hl, de
seg001:467F 36 20    ld      (hl), 20h ; ' '
seg001:4681 C9      ret
; End of function sub_0_4660
seg001:4681
seg001:4682
; SUBROUTINE
seg001:4682
seg001:4682
add_10_to_score:
; CODE XREF: update_score_and_chk_bonus_life|p
seg001:4682 E5      push    hl
seg001:4683 C5      push    bc
seg001:4684 21 CC 3F    ld      hl, 3FCCh ; tens digit
seg001:4687 CD A4 46    call   add_1_to_score_digit
seg001:468A 20 15      jr      nz, loc_0_46A1 ; skip if no carry
seg001:468C 2B      dec     hl ; hundreds digit
seg001:468D CD A4 46    call   add_1_to_score_digit
seg001:4690 20 0F      jr      nz, loc_0_46A1 ; skip if no carry
seg001:4692 2B      dec     hl ; thousands digit
seg001:4693 CD A4 46    call   add_1_to_score_digit
seg001:4696 20 09      jr      nz, loc_0_46A1 ; skip if no carry
seg001:4698 2B      dec     hl ; tens of thousands digit
seg001:4699 CD A4 46    call   add_1_to_score_digit
seg001:469C 20 03      jr      nz, loc_0_46A1 ; skip if no carry
seg001:469E CD B0 46    call   zero_score
seg001:46A1
loc_0_46A1:
; CODE XREF: add_10_to_score+8|j
; add_10_to_score+E|j ...
seg001:46A1 C1      pop     bc
seg001:46A2 E1      pop     hl
seg001:46A3 C9      ret
; End of function add_10_to_score
seg001:46A3
seg001:46A4
; SUBROUTINE
seg001:46A4
seg001:46A4
add_1_to_score_digit:
; CODE XREF: add_10_to_score+5|p
; add_10_to_score+B|p ...
; get score digit
; ?
; yes, skip
; add 1
; store
seg001:46A4 7E      ld      a, (hl)
seg001:46A5 FE 39    cp      39h ; '9'
seg001:46A7 28 03    jr      z, loc_0_46AC
seg001:46A9 3C      inc     a
seg001:46AA 77      ld      (hl), a
seg001:46AB C9      ret
;
seg001:46AC
loc_0_46AC:
; CODE XREF: add_1_to_score_digit+3|j
; set to 0
; flag carry
seg001:46AC 36 30    ld      (hl), 30h ; '0'
seg001:46AE AF      xor     a
seg001:46AF C9      ret
; End of function add_1_to_score_digit
seg001:46AF
seg001:46B0
; SUBROUTINE
seg001:46B0
seg001:46B0
zero_score:
; CODE XREF: add_10_to_score+1C|p
; seg001:49EF|p
; score
; 5 digits to zap
seg001:46B0 21 C9 3F    ld      hl, 3FC9h
seg001:46B3 06 05    ld      b, 5
seg001:46B5
loc_0_46B5:
; CODE XREF: zero_score+8|j
; set digit to 0
; next digit
; loop thru all score digits
seg001:46B5 12      ld      (hl), 30h ; '0'
seg001:46B7 23      inc     hl
seg001:46B8 10 FB    djnz   loc_0_46B5
seg001:46BA C9      ret
; End of function zero_score
seg001:46BA
seg001:46BB
; SUBROUTINE
seg001:46BB
seg001:46BB
update_score_and_chk_bonus_life:
; CODE XREF: update_score_and_chk_bonus_life+27|j
; sub_0_471C+50|p ...
seg001:46BB CD 82 46    call   add_10_to_score
seg001:46BE 21 CC 3F    ld      hl, 3FCCh ; tens digit of score
seg001:46C1 7E      ld      a, (hl)
seg001:46C2 FE 30    cp      30h ; '0'
seg001:46C4 20 1C    jr      nz, loc_0_46E2 ; no, exit
seg001:46C6 2B      dec     hl ; hundreds digit
seg001:46C7 7E      ld      a, (hl)
seg001:46C8 FE 35    cp      35h ; '5'
seg001:46CA 20 16    jr      nz, loc_0_46E2 ; no, skip
seg001:46CC 2B      dec     hl ; thousands digit
seg001:46CD 7E      ld      a, (hl)
seg001:46CE FE 31    cp      31h ; '1'
seg001:46D0 20 10    jr      nz, loc_0_46E2 ; no, skip
seg001:46D2 2B      dec     hl ; tens of thousands digit
seg001:46D3 7E      ld      a, (hl)
seg001:46D4 FE 30    cp      30h ; '0'
seg001:46D6 20 0A    jr      nz, loc_0_46E2 ; no, skip

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seg001:46D8 3A 0F 43      ld      a, (no_lives)
seg001:46DB 3C              inc      a                ; bonus life
seg001:46DC 32 0F 43      ld      (no_lives), a
seg001:46DF CD 90 4E      call    display_lives_left
seg001:46E2
seg001:46E2      loc_0_46E2:                ; CODE XREF: update_score_and_chk_bonus_life+9|j
seg001:46E2 10 D7              ; update_score_and_chk_bonus_life+F|j ...
seg001:46E2      djnz    update_score_and_chk_bonus_life
seg001:46E4 C9              ret
seg001:46E4      ; End of function update_score_and_chk_bonus_life
seg001:46E4
seg001:46E5      ; ██████████ SUBROUTINE ██████████
seg001:46E5
seg001:46E5      sub_0_46E5:                ; CODE XREF: seg001:4F23|p
seg001:46E5 3A 11 43      ld      a, (byte_0_4311)
seg001:46E8 B7              or      a
seg001:46E9 C0              ret     nz
seg001:46EA 3A 00 43      ld      a, (byte_0_4300)
seg001:46ED B7              or      a
seg001:46EE C0              ret     nz
seg001:46EF 3E 14      ld      a, 20
seg001:46F1 32 00 43      ld      (byte_0_4300), a
seg001:46F4 3A 10 43      ld      a, (byte_0_4310)
seg001:46F7 B7              or      a
seg001:46F8 20 08      jr      nz, loc_0_4702
seg001:46FA 3A 0D 43      ld      a, (byte_0_430D)
seg001:46FD EE 01      xor     1
seg001:46FF 32 0D 43      ld      (byte_0_430D), a
seg001:4702
seg001:4702      loc_0_4702:                ; CODE XREF: sub_0_46E5+13|j
seg001:4702 3E 01      ld      a, 1
seg001:4704 32 11 43      ld      (byte_0_4311), a
seg001:4707 D9              exx
seg001:4708 2A 13 43      ld      hl, (word_0_4313)
seg001:470B 11 C0 FF      ld      de, 0FFC0h
seg001:470E 19              add     hl, de
seg001:470F 22 1E 43      ld      (word_0_431E), hl
seg001:4712 7E              ld      a, (hl)
seg001:4713 FE 20      cp      20h ; ' '
seg001:4715 C2 07 48      jp      nz, loc_0_4807
seg001:4718 36 5B      ld      (hl), 5Bh ; '['
seg001:471A D9              exx
seg001:471B C9              ret
seg001:471B      ; End of function sub_0_46E5
seg001:471B
seg001:471C      ; ██████████ SUBROUTINE ██████████
seg001:471C
seg001:471C      sub_0_471C:                ; CODE XREF: sub_0_471C+EC|j
seg001:471C D9              ; seg001:4F39|p
seg001:471C      exx
seg001:471D 2A 1E 43      ld      hl, (word_0_431E)
seg001:4720 7E              ld      a, (hl)
seg001:4721 FE 5B      cp      5Bh ; '['
seg001:4723 20 1A      jr      nz, loc_0_473F
seg001:4725 36 20      ld      (hl), 20h ; ' '
seg001:4727 11 C0 FF      ld      de, 0FFC0h
seg001:472A 19              add     hl, de
seg001:472B CB 54      bit     2, h
seg001:472D 28 61      jr      z, loc_0_4790
seg001:472F 7E              ld      a, (hl)
seg001:4730 FE 80      cp      80h ; 'Ç'
seg001:4732 28 04      jr      z, loc_0_4738
seg001:4734 FE 20      cp      20h ; ' '
seg001:4736 20 07      jr      nz, loc_0_473F
seg001:4738
seg001:4738      loc_0_4738:                ; CODE XREF: sub_0_471C+16|j
seg001:4738 36 5B      ld      (hl), 5Bh ; '['
seg001:4738      ; sub_0_471C+E0|j
seg001:473A
seg001:473A      loc_0_473A:                ; CODE XREF: sub_0_471C+E8|j
seg001:473A 22 1E 43      ld      (word_0_431E), hl
seg001:473D D9              exx
seg001:473E C9              ret
seg001:473F
seg001:473F      loc_0_473F:                ; CODE XREF: sub_0_471C+7|j
seg001:473F      ; sub_0_471C+1A|j
seg001:473F      ld      de, 3C40h
seg001:4742 CD E2 45      call    sub_0_45E2
seg001:4745 B7              or      a
seg001:4746 28 54      jr      z, loc_0_479C
seg001:4748 CB 7E      bit     7, (hl)
seg001:474A CA EA 47      jp      z, loc_0_47EA
seg001:474D E5              push    hl
seg001:474E CD 4A 48      call    sub_0_484A
seg001:4751 D1              pop     de
seg001:4752 CD E2 45      call    sub_0_45E2
seg001:4755 B7              or      a
seg001:4756 D5              push    de
seg001:4757 E1              pop     hl
seg001:4758 CA 0B 48      jp      z, loc_0_480B
seg001:475B CD 28 4D      call    sub_0_4D28
seg001:475E 22 20 40      ld      (4020h), hl
seg001:4761 7E              ld      a, (hl)
seg001:4762 06 03      ld      b, 3
seg001:4764 FE A0      cp      0A0h ; 'á'
seg001:4766 28 04      jr      z, loc_0_476C
seg001:4768 38 01      jr      c, loc_0_476B
seg001:476A 05              dec     b
seg001:476B
seg001:476B      loc_0_476B:                ; CODE XREF: sub_0_471C+4C|j
seg001:476B 05              dec     b
seg001:476C
seg001:476C      loc_0_476C:                ; CODE XREF: sub_0_471C+4A|j
seg001:476C CD BB 46      call    update_score_and_chk_bonus_life
seg001:476F 21 6A 43      ld      hl, explosion
seg001:4772 CD E5 44      call    display_message
seg001:4775 CD 5A 4E      call    delay_15ms
seg001:4778 21 79 43      ld      hl, blank_space
seg001:477B CD E5 44      call    display_message
seg001:477E 3A 01 43      ld      a, (invaders_left)
seg001:4781 3D              dec     a                ; end of wave?

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seg001:4782 CA 74 48      jp      z, loc_0_4874      ; yes, skip
seg001:4785 32 01 43      ld      (invaders_left), a
seg001:4788 11 00 00      ld      de, 0
seg001:478B CD 85 49      call   sub_0_4985
seg001:478E 18 06      jr      loc_0_4796
seg001:4790      ;
seg001:4790      loc_0_4790:      ; CODE XREF: sub_0_471C+11|j
seg001:4790      ld      de, 40h ; '@'
seg001:4793 19      add     hl, de
seg001:4794 36 20      ld      (hl), 20h ; ' '
seg001:4796      loc_0_4796:      ; CODE XREF: sub_0_471C+72|j
seg001:4796 AF      ; sub_0_471C+82|j ...
seg001:4796      xor     a
seg001:4797 32 11 43      ld      (byte_0_4311), a
seg001:479A D9      exx
seg001:479B C9      ret
seg001:479C      ;
seg001:479C      loc_0_479C:      ; CODE XREF: sub_0_471C+2A|j
seg001:479C CB 7E      bit     7, (hl)
seg001:479E 28 F6      jr      z, loc_0_4796
seg001:47A0 21 00 3C      ld      hl, 3C00h
seg001:47A3 06 40      ld      b, 40h ; '@'
seg001:47A5      loc_0_47A5:      ; CODE XREF: sub_0_471C+8E|j
seg001:47A5      bit     7, (hl)
seg001:47A5 CB 7E      jr      nz, loc_0_47AC
seg001:47A7 20 03      inc     hl
seg001:47A9 23      djnz    loc_0_47A5
seg001:47AA 10 F9      djnz    loc_0_47A5
seg001:47AC      loc_0_47AC:      ; CODE XREF: sub_0_471C+8B|j
seg001:47AC E5      push    hl
seg001:47AD 21 00 3C      ld      hl, 3C00h
seg001:47B0 CD 7E 4C      call   clear_video_line_HL
seg001:47B3 21 06 00      ld      hl, 6
seg001:47B6 CD 1D 4D      call   sub_0_4D1D
seg001:47B9 45      ld      b, 1
seg001:47BA AF      xor     a
seg001:47BB 0E 05      ld      c, 5
seg001:47BD      loc_0_47BD:      ; CODE XREF: sub_0_471C+A2|j
seg001:47BD 81      add     a, c
seg001:47BE 10 FD      djnz    loc_0_47BD
seg001:47C0 47      ld      b, a
seg001:47C1 F5      push    af
seg001:47C2 CD BB 46      call   update_score_and_chk_bonus_life
seg001:47C5 F1      pop     af
seg001:47C6 E1      pop     hl
seg001:47C7 22 20 40      ld      (4020h), hl
seg001:47CA 06 0A      ld      b, 0Ah
seg001:47CC 5F      ld      e, a
seg001:47CD 21 00 00      ld      hl, 0
seg001:47D0 55      ld      d, 1
seg001:47D1      loc_0_47D1:      ; CODE XREF: sub_0_471C+B6|j
seg001:47D1      add     hl, de
seg001:47D2 10 FD      djnz    loc_0_47D1
seg001:47D4 3E 3C      ld      a, 3Ch ; '<'
seg001:47D6 CD 33 00      call   33h      ; display character
seg001:47D9 CD AF 0F      call   0FAFh
seg001:47DC 3E 3E      ld      a, 3Eh ; '>'
seg001:47DE CD 33 00      call   33h      ; display character
seg001:47E1 AF      xor     a
seg001:47E2 32 10 43      ld      (byte_0_4310), a
seg001:47E5 32 0C 43      ld      (byte_0_430C), a
seg001:47E8 18 AC      jr      loc_0_4796
seg001:47EA      ;
seg001:47EA      loc_0_47EA:      ; CODE XREF: sub_0_471C+2E|j
seg001:47EA E5      push    hl
seg001:47EB 21 03 00      ld      hl, 3
seg001:47EE CD 1D 4D      call   sub_0_4D1D
seg001:47F1 7D      ld      a, 1
seg001:47F2 E1      pop     hl
seg001:47F3 FE 03      cp      3
seg001:47F5 F5      push    af
seg001:47F6 C4 0A 4E      call   nz, sub_0_4E0A
seg001:47F9 F1      pop     af
seg001:47FA FE 02      cp      2
seg001:47FC DA 38 47      jp      c, loc_0_4738
seg001:47FF C2 96 47      jp      nz, loc_0_4796
seg001:4802 36 20      ld      (hl), 20h ; ' '
seg001:4804 C3 3A 47      jp      loc_0_473A
seg001:4807      ;
seg001:4807      loc_0_4807:      ; CODE XREF: sub_0_46E5+30|j
seg001:4807 D9      exx
seg001:4808 C3 1C 47      jp      sub_0_471C
seg001:480B      ;
seg001:480B      loc_0_480B:      ; CODE XREF: sub_0_471C+3C|j
seg001:480B      call   sub_0_482E
seg001:480E 18 86      jr      loc_0_4796
seg001:480E      ; End of function sub_0_471C
seg001:4810      ;
seg001:4810      ; SUBROUTINE
seg001:4810      ;
seg001:4810      sub_0_4810:      ; CODE XREF: sub_0_4C8A+90|j
seg001:4810 E5      ; sub_0_4D5F+96|p
seg001:4810      push    hl
seg001:4811 C5      push    bc
seg001:4812 7E      ld      a, (hl)
seg001:4813 4F      ld      c, a
seg001:4814 3E BC      ld      a, 0BCh ; 'J'
seg001:4816 A1      and     c
seg001:4817 B9      cp      c
seg001:4818 20 08      jr      nz, loc_0_4822
seg001:481A 3E B0      ld      a, 0B0h ; '0'
seg001:481C A1      and     c
seg001:481D B9      cp      c
seg001:481E 20 02      jr      nz, loc_0_4822
seg001:4820 3E 20      ld      a, 20h ; ' '

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seg001:4822
seg001:4822      loc_0_4822:                ; CODE XREF: sub_0_4810+81j
seg001:4822 FE 80      cp                80h ; 'Ç'                ; sub_0_4810+E1j
seg001:4824      jr                nz, loc_0_4828
seg001:4826 3E 20      ld                a, 20h ; ' '
seg001:4828
seg001:4828      loc_0_4828:                ; CODE XREF: sub_0_4810+141j
seg001:4828 77      ld                (hl), a
seg001:4829 C1      pop                bc
seg001:482A E1      pop                hl
seg001:482B C3 57 4D      jp                loc_0_4D57
seg001:482B      ; End of function sub_0_4810
seg001:482B
seg001:482E
seg001:482E      ;
seg001:482E
seg001:482E
seg001:482E      sub_0_482E:                ; CODE XREF: sub_0_471C+EF1p
seg001:482E E5      push                hl
seg001:482F C5      push                bc
seg001:4830 7E      ld                a, (hl)
seg001:4831 4F      ld                c, a
seg001:4832 3E 8F      ld                a, 8Fh ; 'À'
seg001:4834 A1      and                c
seg001:4835 B9      cp                c
seg001:4836 20 08      jr                nz, loc_0_4840
seg001:4838 3E 83      ld                a, 83h ; 'Ã'
seg001:483A A1      and                c
seg001:483B B9      cp                c
seg001:483C 20 02      jr                nz, loc_0_4840
seg001:483E 3E 20      ld                a, 20h ; ' '
seg001:4840
seg001:4840      loc_0_4840:                ; CODE XREF: sub_0_482E+81j
seg001:4840 FE 80      cp                80h ; 'Ç'                ; sub_0_482E+E1j
seg001:4842 20 02      jr                nz, loc_0_4846
seg001:4844 3E 20      ld                a, 20h ; ' '
seg001:4846
seg001:4846      loc_0_4846:                ; CODE XREF: sub_0_482E+141j
seg001:4846 77      ld                (hl), a
seg001:4847 C1      pop                bc
seg001:4848 E1      pop                hl
seg001:4849 C9      ret
seg001:4849      ; End of function sub_0_482E
seg001:4849
seg001:484A
seg001:484A      ;
seg001:484A
seg001:484A
seg001:484A      sub_0_484A:                ; CODE XREF: sub_0_471C+321p
seg001:484A 2A 08 43      ld                hl, (word_0_4308)                ; sub_0_4D5F+7D1p
seg001:484A 7C      ld                a, h
seg001:484E B7      or                a
seg001:484F 20 11      jr                nz, loc_0_4862
seg001:4851 2A 06 43      ld                hl, (word_0_4306)
seg001:4854 7C      ld                a, h
seg001:4855 B7      or                a
seg001:4856 20 0A      jr                nz, loc_0_4862
seg001:4858 2A 04 43      ld                hl, (word_0_4304)
seg001:485B 7C      ld                a, h
seg001:485C B7      or                a
seg001:485D 20 03      jr                nz, loc_0_4862
seg001:485F 2A 02 43      ld                hl, (word_0_4302)
seg001:4862
seg001:4862      loc_0_4862:                ; CODE XREF: sub_0_484A+51j
seg001:4862      ; sub_0_484A+C1j ...
seg001:4862      push                de
seg001:4863 C5      push                bc
seg001:4864 11 3F 00      ld                de, 3Fh ; '?'
seg001:4867 19      add                hl, de
seg001:4868 06 3F      ld                b, 3Fh ; '?'
seg001:486A
seg001:486A      loc_0_486A:                ; CODE XREF: sub_0_484A+251j
seg001:486A CB 7E      bit                7, (hl)
seg001:486C 20 03      jr                nz, loc_0_4871
seg001:486E 2B      dec                hl
seg001:486F 10 F9      djnz               loc_0_486A
seg001:4871
seg001:4871      loc_0_4871:                ; CODE XREF: sub_0_484A+221j
seg001:4871 C1      pop                bc
seg001:4872 D1      pop                de
seg001:4873 C9      ret
seg001:4873      ; End of function sub_0_484A
seg001:4873
seg001:4874
seg001:4874      ;
seg001:4874
seg001:4874      loc_0_4874:                ; CODE XREF: sub_0_471C+661j
seg001:4874 C3 F5 49      jp                new_wave
seg001:4877
seg001:4877      ;
seg001:4877
seg001:4877
seg001:4877      sub_0_4877:                ; CODE XREF: sub_0_4B48+C1p
seg001:4877 11 40 00      ld                de, 40h ; '@'                ; seg001:4B8B1p
seg001:4877 06 0D      ld                b, 0Dh
seg001:487C
seg001:487C      loc_0_487C:                ; CODE XREF: sub_0_4877+A1j
seg001:487C CB 7E      bit                7, (hl)
seg001:487E 20 06      jr                nz, loc_0_4886
seg001:4880 19      add                hl, de
seg001:4881 10 F9      djnz               loc_0_487C
seg001:4883 3E 20      ld                a, 20h ; ' '
seg001:4885 C9      ret
seg001:4886
seg001:4886      ;
seg001:4886
seg001:4886      loc_0_4886:                ; CODE XREF: sub_0_4877+71j
seg001:4886 AF      xor                a
seg001:4887 C9      ret
seg001:4887      ; End of function sub_0_4877
seg001:4887
seg001:4888
seg001:4888      ;
seg001:4888
seg001:4888      ;
seg001:4888
seg001:4888      ;

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seg001:4888
seg001:4888      sub_0_4888:                ; CODE XREF: seg001:4F2B|p
seg001:4888 3A 08 38      ld      a, (3808h)                ; keyboard
seg001:488B E6 05      and      5                    ; "X" or "Z" pressed?
seg001:488D C8      ret                        ; no return
seg001:488E FE 04      cp      4                    ; "Z"?
seg001:4890 30 16      jr      nc, loc_0_48A8        ; yes, skip
seg001:4892 3A BB 3F      ld      a, (3FBBh)
seg001:4895 CB 7F      bit      7, a
seg001:4897 C0      ret      nz
seg001:4898 D9      exx
seg001:4899 21 80 3F      ld      hl, 3F80h
seg001:489C CD 3E 46      call    sub_0_463E
seg001:489F 2A 13 43      ld      hl, (word_0_4313)
seg001:48A2 23      inc      hl
seg001:48A3 22 13 43      ld      (word_0_4313), hl
seg001:48A6
seg001:48A6      loc_0_48A6:                ; CODE XREF: sub_0_4888+35|j
seg001:48A6 D9      exx
seg001:48A7 C9      ret
;
seg001:48A8
seg001:48A8      loc_0_48A8:                ; CODE XREF: sub_0_4888+8|j
seg001:48A8 C0      ret      nz
seg001:48A9 3A 84 3F      ld      a, (3F84h)
seg001:48AC CB 7F      bit      7, a
seg001:48AE C0      ret      nz
seg001:48AF D9      exx
seg001:48B0 21 80 3F      ld      hl, 3F80h
seg001:48B3 CD 60 46      call    sub_0_4660
seg001:48B6 2A 13 43      ld      hl, (word_0_4313)
seg001:48B9 2B      dec      hl
seg001:48BA 22 13 43      ld      (word_0_4313), hl
seg001:48BD 18 E7      jr      loc_0_48A6
; End of function sub_0_4888
seg001:48BD
seg001:48BF
seg001:48BF      ; SUBROUTINE
seg001:48BF
seg001:48BF      sub_0_48BF:                ; CODE XREF: seg001:4F44|p
seg001:48BF 3A 0C 43      ld      a, (byte_0_430C)
seg001:48C2 3C      inc      a
seg001:48C3 32 0C 43      ld      (byte_0_430C), a
seg001:48C6 C0      ret      nz
seg001:48C7 3A 01 43      ld      a, (invaders_left)
seg001:48CA FE 08      cp      8
seg001:48CC D8      ret      c
seg001:48CD 3A 10 43      ld      a, (byte_0_4310)
seg001:48D0 B7      or      a
seg001:48D1 C0      ret      nz
seg001:48D2 D9      exx
seg001:48D3 3E 41      ld      a, 41h ; 'A'
seg001:48D5 32 0B 43      ld      (byte_0_430B), a
seg001:48D8 3A 0D 43      ld      a, (byte_0_430D)
seg001:48DB B7      or      a
seg001:48DC 28 05      jr      z, loc_0_48E3
seg001:48DE 21 00 3C      ld      hl, 3C00h
seg001:48E1 18 03      jr      loc_0_48E6
;
seg001:48E3
seg001:48E3      loc_0_48E3:                ; CODE XREF: sub_0_48BF+1D|j
seg001:48E3 21 3A 3C      ld      hl, 3C3Ah                ; cursor potition
seg001:48E6
seg001:48E6      loc_0_48E6:                ; CODE XREF: sub_0_48BF+22|j
seg001:48E6 22 20 40      ld      (4020h), hl
seg001:48E9 21 4A 43      ld      hl, ufo
seg001:48EC CD E5 44      call    display_message
seg001:48EF 3E 01      ld      a, 1
seg001:48F1 32 10 43      ld      (byte_0_4310), a
seg001:48F4 D9      exx
seg001:48F5 C9      ret
; End of function sub_0_48BF
seg001:48F5
seg001:48F5      ; SUBROUTINE
seg001:48F6
seg001:48F6
seg001:48F6      sub_0_48F6:                ; CODE XREF: seg001:4F41|p
seg001:48F6 3A 10 43      ld      a, (byte_0_4310)
seg001:48F9 B7      or      a
seg001:48FA C8      ret      z
seg001:48FB D9      exx
seg001:48FC 21 00 3C      ld      hl, 3C00h
seg001:48FF 06 3F      ld      b, 3Fh ; '?'
seg001:4901
seg001:4901      loc_0_4901:                ; CODE XREF: sub_0_48F6+15|j
seg001:4901 7E      ld      a, (hl)
seg001:4902 FE BB      cp      0BBh ; 'q'
seg001:4904 28 09      jr      z, loc_0_490F
seg001:4906 FE B7      cp      0B7h ; 'A'
seg001:4908 28 09      jr      z, loc_0_4913
seg001:490A
seg001:490A      loc_0_490A:                ; CODE XREF: sub_0_48F6+1B|j
seg001:490A 23      ; sub_0_48F6+1F|j
seg001:490A      inc      hl
seg001:490B 10 F4      djnz    loc_0_4901
seg001:490D 18 08      jr      loc_0_4917
;
seg001:490F
seg001:490F      loc_0_490F:                ; CODE XREF: sub_0_48F6+E|j
seg001:490F 36 B7      ld      (hl), 0B7h ; 'A'
seg001:4911 18 F7      jr      loc_0_490A
;
seg001:4913
seg001:4913      loc_0_4913:                ; CODE XREF: sub_0_48F6+12|j
seg001:4913 36 BB      ld      (hl), 0BBh ; 'q'
seg001:4915 18 F3      jr      loc_0_490A
;
seg001:4917
seg001:4917      loc_0_4917:                ; CODE XREF: sub_0_48F6+17|j
seg001:4917 3A 0D 43      ld      a, (byte_0_430D)
seg001:491A B7      or      a
seg001:491B 28 08      jr      z, loc_0_4925
seg001:491D 21 00 3C      ld      hl, 3C00h
seg001:4920 CD 3E 46      call    sub_0_463E

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seg001:4923 18 06      jr      loc_0_492B
seg001:4925          ; -----
seg001:4925
seg001:4925      loc_0_4925:      hl, 3C00h      ; CODE XREF: sub_0_48F6+25↑j
seg001:4925      ld
seg001:4928 CD 60 46      call   sub_0_4660
seg001:492B
seg001:492B      loc_0_492B:      ; CODE XREF: sub_0_48F6+2D↑j
seg001:492B      ld      a, (byte_0_430B)
seg001:492E 3D          dec      a
seg001:492F 32 0B 43      ld      (byte_0_430B), a
seg001:4932 28 02      jr      z, loc_0_4936
seg001:4934
seg001:4934      loc_0_4934:      ; CODE XREF: sub_0_48F6+44↑j
seg001:4934 D9          exx
seg001:4935 C9          ret
seg001:4936          ; -----
seg001:4936
seg001:4936      loc_0_4936:      ; CODE XREF: sub_0_48F6+3C↑j
seg001:4936 AF          xor      a
seg001:4937 32 10 43      ld      (byte_0_4310), a
seg001:493A 18 F8      jr      loc_0_4934
seg001:493A      ; End of function sub_0_48F6
seg001:493A          ; -----
seg001:493C
seg001:493C
seg001:493C      game_over:      ; CODE XREF: seg001:4AB4↑j
seg001:493C          ; seg001:4B45↑j
seg001:493C      ld      sp, 428Ah
seg001:493F 21 19 3C      ld      hl, 3C19h      ; cursor position
seg001:4942 22 20 40      ld      (4020h), hl
seg001:4945 21 00 3C      ld      hl, 3C00h      ; start of video
seg001:4948 CD 7E 4C      call   clear_video_line_HL
seg001:494B 21 93 44      ld      hl, aGAMEOVER      ; "G A M E - O V E R"
seg001:494E CD 05 45      call   display_message_slowly
seg001:4951 CD 5F 4C      call   check_for_new_high_score
seg001:4954 01 FF FF      ld      bc, 0FFFFh      ; ~1s
seg001:4957 CD 60 00      call   60h      ; delay
seg001:495A CD 60 00      call   60h      ; delay
seg001:495D CD 60 00      call   60h      ; delay
seg001:4960 C3 4F 45      jp      attract_loop
seg001:4963          ; [REDACTED] S U B R O U T I N E [REDACTED]
seg001:4963
seg001:4963
seg001:4963      display_object_x10:      ; CODE XREF: seg001:4A78↑p
seg001:4963          ; seg001:4A81↑p ...
seg001:4963      push     hl
seg001:4964 D5          push     de
seg001:4965 C5          push     bc
seg001:4966 06 0A      ld      b, 10      ; 10 objects to display
seg001:4968 D5          push     de
seg001:4969 11 40 00      ld      de, 40h ; '@'
seg001:496C ED 52      sbc      hl, de
seg001:496E D1          pop      de
seg001:496F 23          inc      hl
seg001:4970
seg001:4970      loc_0_4970:      ; CODE XREF: display_object_x10+1C↑j
seg001:4970      ld      (4020h), hl      ; cursor position
seg001:4973 D5          push     de
seg001:4974 E5          push     hl
seg001:4975 EB          ex      de, hl
seg001:4976 CD E5 44      call   display_message
seg001:4979 E1          pop      hl
seg001:497A 11 06 00      ld      de, 6
seg001:497D 19          add      hl, de
seg001:497E D1          pop      de
seg001:497F 10 EF      djnz    loc_0_4970
seg001:4981 C1          pop      bc
seg001:4982 D1          pop      de
seg001:4983 E1          pop      hl
seg001:4984 C9          ret
seg001:4984      ; End of function display_object_x10
seg001:4984
seg001:4985          ; [REDACTED] S U B R O U T I N E [REDACTED]
seg001:4985
seg001:4985
seg001:4985      sub_0_4985:      ; CODE XREF: sub_0_471C+6F↑p
seg001:4985      push     hl
seg001:4986 D5          push     de
seg001:4987 C5          push     bc
seg001:4988 2A 02 43      ld      hl, (word_0_4302)
seg001:498B CD B0 49      call   sub_0_49B0
seg001:498E 22 02 43      ld      (word_0_4302), hl
seg001:4991 2A 04 43      ld      hl, (word_0_4304)
seg001:4994 CD B0 49      call   sub_0_49B0
seg001:4997 22 04 43      ld      (word_0_4304), hl
seg001:499A 2A 06 43      ld      hl, (word_0_4306)
seg001:499D CD B0 49      call   sub_0_49B0
seg001:49A0 22 06 43      ld      (word_0_4306), hl
seg001:49A3 2A 08 43      ld      hl, (word_0_4308)
seg001:49A6 CD B0 49      call   sub_0_49B0
seg001:49A9 22 08 43      ld      (word_0_4308), hl
seg001:49AC C1          pop      bc
seg001:49AD D1          pop      de
seg001:49AE E1          pop      hl
seg001:49AF C9          ret
seg001:49AF      ; End of function sub_0_4985
seg001:49AF
seg001:49B0          ; [REDACTED] S U B R O U T I N E [REDACTED]
seg001:49B0
seg001:49B0
seg001:49B0      sub_0_49B0:      ; CODE XREF: sub_0_4985+6↑p
seg001:49B0          ; sub_0_4985+F↑p ...
seg001:49B0      push     hl
seg001:49B1 06 3F      ld      b, 3Fh ; '?'
seg001:49B3
seg001:49B3      loc_0_49B3:      ; CODE XREF: sub_0_49B0+9↑j
seg001:49B3      ld      a, (hl)
seg001:49B4 CB 7F      bit     7, a
seg001:49B6 23          inc      hl
seg001:49B7 20 06      jr      nz, loc_0_49BF
seg001:49B9 10 F8      djnz    loc_0_49B3
seg001:49BB E1          pop      hl

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seg001:49BC 26 00      ld      h, 0
seg001:49BE C9        ret
seg001:49BF          ; -----
seg001:49BF          loc_0_49BF:          ; CODE XREF: sub_0_49B0+7|j
seg001:49BF          pop      hl
seg001:49C0 19        add     hl, de
seg001:49C1 C9        ret
seg001:49C1          ; End of function sub_0_49B0
seg001:49C2          ; -----
seg001:49C2          start_game:          ; CODE XREF: check_for_R_key+5|j
seg001:49C2 AF        xor      a
seg001:49C3 32 0C 43   ld      (byte_0_430C), a
seg001:49C6 32 15 43   ld      (byte_0_4315), a
seg001:49C9 32 12 43   ld      (byte_0_4312), a
seg001:49CC 32 0D 43   ld      (byte_0_430D), a
seg001:49CF 32 0E 43   ld      (wave_no), a
seg001:49D2 32 10 43   ld      (byte_0_4310), a
seg001:49D5 32 11 43   ld      (byte_0_4311), a
seg001:49D8 32 22 43   ld      (byte_0_4322), a
seg001:49DB 3C        inc      a
seg001:49DC 32 0A 43   ld      (byte_0_430A), a
seg001:49DF 3E 05      ld      a, 5
seg001:49E1 32 0C 43   ld      (byte_0_430C), a
seg001:49E4 3E 03      ld      a, 3
seg001:49E6 32 0F 43   ld      (no_lives), a
seg001:49E9 CD 90 4E   call   display_lives_left
seg001:49EC 31 8A 42   ld      sp, 428Ah
seg001:49EF CD B0 46   call   zero_score
seg001:49F2 CD 31 4E   call   display_GOOD_LUCK
seg001:49F5          new_wave:          ; CODE XREF: seg001:4874|j
seg001:49F5          ld      sp, 428Ah
seg001:49F8 AF        xor      a
seg001:49F9 32 11 43   ld      (byte_0_4311), a
seg001:49FC 3A 0E 43   ld      a, (wave_no)
seg001:49FF 3C        inc      a          ; next wave number
seg001:4A00 FE 07      cp      7          ; highest?
seg001:4A02 20 02      jr      nz, loc_0_4A06 ; no, skip
seg001:4A04 3E 01      ld      a, 1          ; reset to 1
seg001:4A06          loc_0_4A06:          ; CODE XREF: seg001:4A02|j
seg001:4A06          ld      (wave_no), a
seg001:4A09 E6 06      and     6
seg001:4A0B 11 40 00   ld      de, 40h ; '@'
seg001:4A0E 62        ld      h, d
seg001:4A0F 6B        ld      l, e
seg001:4A10 06 01      ld      b, 1
seg001:4A12 FE 02      cp      2
seg001:4A14 38 06      jr      c, loc_0_4A1C
seg001:4A16 28 02      jr      z, loc_0_4A1A
seg001:4A18 04        inc     b
seg001:4A19 19        add     hl, de
seg001:4A1A          loc_0_4A1A:          ; CODE XREF: seg001:4A16|j
seg001:4A1A          inc     b
seg001:4A1B 19        add     hl, de
seg001:4A1C          loc_0_4A1C:          ; CODE XREF: seg001:4A14|j
seg001:4A1C          ex      de, hl
seg001:4A1D          loc_0_4A1D:          ; CODE XREF: seg001:4A40|j
seg001:4A1D          push   bc
seg001:4A1E DD 21 16 43 ld      ix, 4316h
seg001:4A22 FD 21 02 43 ld      iy, word_0_4302
seg001:4A26 06 04      ld      b, 4
seg001:4A28          loc_0_4A28:          ; CODE XREF: seg001:4A3D|j
seg001:4A28          ld      l, (ix+0)
seg001:4A2B DD 66 01   ld      h, (ix+1)
seg001:4A2E 19        add     hl, de
seg001:4A2F FD 75 00   ld      (iy+0), l
seg001:4A32 FD 74 01   ld      (iy+1), h
seg001:4A35 DD 23      inc     ix
seg001:4A37 DD 23      inc     ix
seg001:4A39 FD 23      inc     iy
seg001:4A3B FD 23      inc     iy
seg001:4A3D 10 E9     djnz   loc_0_4A28
seg001:4A3F C1        pop     bc
seg001:4A40 10 DB     djnz   loc_0_4A1D
seg001:4A42 CD 18 45   call   wipe_screen_left_to_right_slow
seg001:4A45 21 09 3F   ld      hl, 3F09h          ; cursor position
seg001:4A48 22 20 40   ld      (4020h), hl
seg001:4A4B 21 51 43   ld      hl, shield          ; shield #1
seg001:4A4E E5        push   hl
seg001:4A4F CD E5 44   call   display_message
seg001:4A52 21 17 3F   ld      hl, 3F17h          ; cursor position
seg001:4A55 22 20 40   ld      (4020h), hl
seg001:4A58 E1        pop     hl
seg001:4A59 E5        push   hl          ; shield #2
seg001:4A5A CD E5 44   call   display_message
seg001:4A5D 21 24 3F   ld      hl, 3F24h          ; cursor position
seg001:4A60 22 20 40   ld      (4020h), hl
seg001:4A63 E1        pop     hl
seg001:4A64 E5        push   hl          ; shield #3
seg001:4A65 CD E5 44   call   display_message
seg001:4A68 21 31 3F   ld      hl, 3F31h          ; cursor position
seg001:4A6B 22 20 40   ld      (4020h), hl
seg001:4A6E E1        pop     hl          ; shield #4
seg001:4A6F CD E5 44   call   display_message
seg001:4A72 11 23 43   ld      de, invader_30pt
seg001:4A75 2A 02 43   ld      hl, (word_0_4302)
seg001:4A78 CD 63 49   call   display_object_x10
seg001:4A7B 11 30 43   ld      de, invader_20pt
seg001:4A7E 2A 04 43   ld      hl, (word_0_4304)
seg001:4A81 CD 63 49   call   display_object_x10
seg001:4A84 11 3D 43   ld      de, invader_10pt
seg001:4A87 2A 06 43   ld      hl, (word_0_4306)
seg001:4A8A CD 63 49   call   display_object_x10
seg001:4A8D 2A 08 43   ld      hl, (word_0_4308)
seg001:4A90 CD 63 49   call   display_object_x10
seg001:4A93 3E 28      ld      a, 40          ; number of invaders left
seg001:4A95 32 01 43   ld      (invaders_left), a
seg001:4A98 32 21 43   ld      (byte_0_4321), a

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seg001:4A9B      loc_0_4A9B:      ; CODE XREF: seg001:4AD9+j
seg001:4A9B      ld             hl, 3F84h
seg001:4A9B      ld             (4020h), hl
seg001:4A9B      ld             hl, player
seg001:4A9B      call          display_message
seg001:4AA1      ld             hl, 3F86h
seg001:4AA7      ld             (word_0_4313), hl
seg001:4AAA      ld             loc_0_4EFB
seg001:4AAD      jp             loc_0_4EFB
;
seg001:4AB0
seg001:4AB0      loc_0_4AB0:      ; CODE XREF: seg001:4B2A+j
seg001:4AB0      ld             a, (no_lives)
seg001:4AB0      dec            a
seg001:4AB3      ld             z, game_over
seg001:4AB4      ld             (no_lives), a
seg001:4AB7      call          display_lives_left
seg001:4ABD      xor            a
seg001:4ABE      ld             (byte_0_4311), a
seg001:4AC1      ld             (byte_0_4312), a
seg001:4AC4      call          sub_0_4D3B
seg001:4AC7      ld             hl, 3F80h
seg001:4AC7      call          clear_video_line_HL
seg001:4ACD      ld             bc, 0FFFFh
seg001:4AD0      call          60h
seg001:4AD3      call          60h
seg001:4AD6      ld             sp, 428Ah
seg001:4AD9      jp             loc_0_4A9B
;
; SUBROUTINE
;
seg001:4ADC      sub_0_4ADC:      ; CODE XREF: sub_0_4B1A+4+j
seg001:4ADC      ld             hl, 3C00h
seg001:4ADC      ld             bc, 400h
; sub_0_4B1A+B+j ...
seg001:4AE2      loc_0_4AE2:      ; CODE XREF: sub_0_4ADC+1C+j
seg001:4AE2      ld             a, (hl)
seg001:4AE3      cp             20h ; ' '
seg001:4AE5      jr             nz, loc_0_4AE9
seg001:4AE7      ld             (hl), 80h ; 'Q'
seg001:4AE9      loc_0_4AE9:      ; CODE XREF: sub_0_4ADC+9+j
seg001:4AE9      bit            7, (hl)
seg001:4AEB      jr             z, loc_0_4AF4
seg001:4AED      ld             a, (hl)
seg001:4AEE      cpl
seg001:4AEF      set            7, a
seg001:4AF1      res            6, a
seg001:4AF3      ld             (hl), a
seg001:4AF4      loc_0_4AF4:      ; CODE XREF: sub_0_4ADC+F+j
seg001:4AF4      inc            hl
seg001:4AF5      dec            bc
seg001:4AF6      ld             a, b
seg001:4AF7      or             c
seg001:4AF8      jr             nz, loc_0_4AE2
seg001:4AFA      ret
; End of function sub_0_4ADC
;
; SUBROUTINE
;
seg001:4AFB      sub_0_4AFB:      ; CODE XREF: sub_0_4B1A+p
seg001:4AFB      ld             hl, (word_0_4313)
seg001:4AFE      dec            hl
seg001:4AFF      dec            hl
seg001:4B00      ret
; End of function sub_0_4AFB
;
; SUBROUTINE
;
seg001:4B01      sub_0_4B01:      ; CODE XREF: sub_0_4B1A+8+j
seg001:4B01      ld             a, 0A6h ; 'A'
seg001:4B03      ld             b, 0
seg001:4B05      loc_0_4B05:      ; CODE XREF: sub_0_4B01+16+j
seg001:4B05      push          bc
seg001:4B06      push          hl
seg001:4B07      ld             b, 5
seg001:4B09      xor            3Fh ; '?'
seg001:4B0B      loc_0_4B0B:      ; CODE XREF: sub_0_4B01+C+j
seg001:4B0B      ld             (hl), a
seg001:4B0C      inc            hl
seg001:4B0D      djnz          loc_0_4B0B
seg001:4B0F      loc_0_4B0F:      ; CODE XREF: sub_0_4B01+12+j
seg001:4B0F      ex             (sp), hl
seg001:4B10      ex             (sp), hl
seg001:4B11      ex             (sp), hl
seg001:4B12      ex             (sp), hl
seg001:4B13      djnz          loc_0_4B0F
seg001:4B15      pop            hl
seg001:4B16      pop            bc
seg001:4B17      djnz          loc_0_4B05
seg001:4B19      ret
; End of function sub_0_4B01
;
; SUBROUTINE
;
seg001:4B1A      sub_0_4B1A:      ; CODE XREF: seg001:4B27+p
seg001:4B1A      call          sub_0_4AFB
seg001:4B1D      push          hl
seg001:4B1E      call          sub_0_4ADC
seg001:4B21      pop            hl
seg001:4B22      call          sub_0_4B01
seg001:4B25      jr             sub_0_4ADC
; End of function sub_0_4B1A

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seg001:4B27      ; -----
seg001:4B27
seg001:4B27
seg001:4B27 CD 1A 4B      loc_0_4B27:      ; CODE XREF: sub_0_4D5F+93|j
seg001:4B2A C3 B0 4A      call      sub_0_4B1A
seg001:4B2D      ; -----
seg001:4B2D
seg001:4B2D      loc_0_4B2D:      ; CODE XREF: seg001:4C02|j
seg001:4B2D 06 0A      ld      b, 0Ah
seg001:4B2F      loc_0_4B2F:      ; CODE XREF: seg001:4B43|j
seg001:4B2F C5      push     bc
seg001:4B30 CD DC 4A      call     sub_0_4ADC
seg001:4B33 01 10 27      ld      bc, 2710h
seg001:4B36 CD 60 00      call     60h
seg001:4B39 CD DC 4A      call     sub_0_4ADC
seg001:4B3C 01 10 27      ld      bc, 2710h
seg001:4B3F CD 60 00      call     60h
seg001:4B42 C1      pop      bc
seg001:4B43 10 EA      djnz     loc_0_4B2F
seg001:4B45 C3 3C 49      jp      game_over
seg001:4B48      ; ----- SUBROUTINE -----
seg001:4B48
seg001:4B48
seg001:4B48      sub_0_4B48:      ; CODE XREF: seg001:4F71|p
seg001:4B48 E5      push     hl
seg001:4B49 D5      push     de
seg001:4B4A C5      push     bc
seg001:4B4B 3A 0A 43      ld      a, (byte_0_430A)
seg001:4B4E B7      or      a
seg001:4B4F 28 37      jr      z, loc_0_4B88
seg001:4B51 21 7F 3C      ld      hl, 3C7Fh
seg001:4B54 CD 77 48      call     sub_0_4877
seg001:4B57 B7      or      a
seg001:4B58 CA BE 4B      jp      z, loc_0_4BBE
seg001:4B5B 2A 08 43      ld      hl, (word_0_4308)
seg001:4B5E CD 7A 4B      call     sub_0_4B7A
seg001:4B61 2A 06 43      ld      hl, (word_0_4306)
seg001:4B64 CD 7A 4B      call     sub_0_4B7A
seg001:4B67 2A 04 43      ld      hl, (word_0_4304)
seg001:4B6A CD 7A 4B      call     sub_0_4B7A
seg001:4B6D 2A 02 43      ld      hl, (word_0_4302)
seg001:4B70 CD 7A 4B      call     sub_0_4B7A
seg001:4B73 CD FC 45      call     sub_0_45FC
seg001:4B76      loc_0_4B76:      ; CODE XREF: seg001:4BAC|j
seg001:4B76 C1      ; seg001:4C1D|j ...
seg001:4B76      pop      bc
seg001:4B77 D1      pop      de
seg001:4B78 E1      pop      hl
seg001:4B79 C9      ret
seg001:4B79      ; End of function sub_0_4B48
seg001:4B7A      ; ----- SUBROUTINE -----
seg001:4B7A
seg001:4B7A
seg001:4B7A      sub_0_4B7A:      ; CODE XREF: sub_0_4B48+16|p
seg001:4B7A 7C      ; sub_0_4B48+1C|p ...
seg001:4B7A      ld      a, h
seg001:4B7B B7      or      a
seg001:4B7C C8      ret      z
seg001:4B7D CD 3E 46      call     sub_0_463E
seg001:4B80 11 40 00      ld      de, 40h ; '@'
seg001:4B83 ED 52      sbc     hl, de
seg001:4B85 C3 3E 46      jp      sub_0_463E
seg001:4B85      ; End of function sub_0_4B7A
seg001:4B88      ; -----
seg001:4B88
seg001:4B88      loc_0_4B88:      ; CODE XREF: sub_0_4B48+7|j
seg001:4B88 21 40 3C      ld      hl, 3C40h
seg001:4B8B CD 77 48      call     sub_0_4877
seg001:4B8E B7      or      a
seg001:4B8F 28 38      jr      z, loc_0_4BC9
seg001:4B91 CD FC 45      call     sub_0_45FC
seg001:4B94      loc_0_4B94:      ; CODE XREF: seg001:4BC6|j
seg001:4B94 2A 08 43      ld      hl, (word_0_4308)
seg001:4B97 CD AE 4B      call     sub_0_4BAE
seg001:4B9A 2A 06 43      ld      hl, (word_0_4306)
seg001:4B9D CD AE 4B      call     sub_0_4BAE
seg001:4BA0 2A 04 43      ld      hl, (word_0_4304)
seg001:4BA3 CD AE 4B      call     sub_0_4BAE
seg001:4BA6 2A 02 43      ld      hl, (word_0_4302)
seg001:4BA9 CD AE 4B      call     sub_0_4BAE
seg001:4BAC 18 C8      jr      loc_0_4B76
seg001:4BAE      ; ----- SUBROUTINE -----
seg001:4BAE
seg001:4BAE
seg001:4BAE      sub_0_4BAE:      ; CODE XREF: seg001:4B97|p
seg001:4BAE 7C      ; seg001:4B9D|p ...
seg001:4BAE      ld      a, h
seg001:4BAF B7      or      a
seg001:4BB0 C8      ret      z
seg001:4BB1 E5      push     hl
seg001:4BB2 CD 60 46      call     sub_0_4660
seg001:4BB5 E1      pop      hl
seg001:4BB6 11 40 00      ld      de, 40h ; '@'
seg001:4BB9 ED 52      sbc     hl, de
seg001:4BBB C3 60 46      jp      sub_0_4660
seg001:4BBB      ; End of function sub_0_4BAE
seg001:4BBB      ; -----
seg001:4BBE
seg001:4BBE
seg001:4BBE      loc_0_4BBE:      ; CODE XREF: sub_0_4B48+10|j
seg001:4BBE 3A 0A 43      ld      a, (byte_0_430A)
seg001:4BC1 EE 01      xor     l
seg001:4BC3 32 0A 43      ld      (byte_0_430A), a
seg001:4BC6 C3 94 4B      jp      loc_0_4B94
seg001:4BC9      ; -----
seg001:4BC9
seg001:4BC9      loc_0_4BC9:      ; CODE XREF: seg001:4B8F|j
seg001:4BC9 3A 11 43      ld      a, (byte_0_4311)

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seg001:4BCC B7          or      a
seg001:4BCD 28 05      jr      z, loc_0_4BD4
seg001:4BCF 2A 1E 43    ld      hl, (word_0_431E)
seg001:4BD2 36 20      ld      (hl), 20h ; ' '
seg001:4BD4
seg001:4BD4      loc_0_4BD4:          ; CODE XREF: seg001:4BCD↑j
seg001:4BD4 DD 21 08 43 ld      ix, 4308h
seg001:4BD8 06 04      ld      b, 4
seg001:4BDA
seg001:4BDA      loc_0_4BDA:          ; CODE XREF: seg001:4BE9↑j
seg001:4BDA DD 6E 00      ld      l, (ix+0)
seg001:4BDD DD 66 01      ld      h, (ix+1)
seg001:4BE0 7C          ld      a, h
seg001:4BE1 B7          or      a
seg001:4BE2 C4 2E 4C    call   nz, sub_0_4C2E
seg001:4BE5 DD 2B          dec     ix
seg001:4BE7 DD 2B          dec     ix
seg001:4BE9 10 EF      djnz   loc_0_4BDA
seg001:4BEB DD 21 08 43 ld      ix, 4308h
seg001:4BEF 06 04      ld      b, 4
seg001:4BF1 11 80 3F    ld      de, 3F80h
seg001:4BF4
seg001:4BF4      loc_0_4BF4:          ; CODE XREF: seg001:4C0F↑j
seg001:4BF4 DD 6E 00      ld      l, (ix+0)
seg001:4BF7 DD 66 01      ld      h, (ix+1)
seg001:4BFA CD 55 4C    call   sub_0_4C55
seg001:4BFD CD E2 45    call   sub_0_45E2
seg001:4C00 FE 20      cp      20h ; ' '
seg001:4C02 CA 2D 4B    jp      z, loc_0_4B2D
seg001:4C05 DD 75 00      ld      (ix+0), l
seg001:4C08 DD 74 01      ld      (ix+1), h
seg001:4C0B DD 2B          dec     ix
seg001:4C0D DD 2B          dec     ix
seg001:4C0F 10 E3      djnz   loc_0_4BF4
seg001:4C11 3A 0A 43    ld      a, (byte_0_430A)
seg001:4C14 EE 01      xor     l
seg001:4C16 32 0A 43    ld      (byte_0_430A), a
seg001:4C19 3A 11 43    ld      a, (byte_0_4311)
seg001:4C1C B7          or      a
seg001:4C1D CA 76 4B    jp      z, loc_0_4B76
seg001:4C20 2A 1E 43    ld      hl, (word_0_431E)
seg001:4C23 7E          ld      a, (hl)
seg001:4C24 FE 20      cp      20h ; ' '
seg001:4C26 C2 76 4B    jp      nz, loc_0_4B76
seg001:4C29 36 5B      ld      (hl), 5Bh ; '['
seg001:4C2B C3 76 4B    jp      loc_0_4B76
seg001:4C2E
seg001:4C2E      ; SUBROUTINE
seg001:4C2E
seg001:4C2E
seg001:4C2E
seg001:4C2E      sub_0_4C2E:          ; CODE XREF: seg001:4BE2↑p
seg001:4C2E C5          push    bc
seg001:4C2F E5          push    hl
seg001:4C30 11 3F 00    ld      de, 3Fh ; '?'
seg001:4C33 19          add     hl, de
seg001:4C34 E5          push    hl
seg001:4C35 13          inc     de
seg001:4C36 19          add     hl, de
seg001:4C37 EB          ex      de, hl
seg001:4C38 E1          pop     hl
seg001:4C39 06 80      ld      b, 80h ; 'Ç'
seg001:4C3B
seg001:4C3B      loc_0_4C3B:          ; CODE XREF: sub_0_4C2E+1A↑j
seg001:4C3B 1A          ld      a, (de)
seg001:4C3C FE 80      cp      80h ; 'Ç'
seg001:4C3E 7E          ld      a, (hl)
seg001:4C3F 30 04      jr      nc, loc_0_4C45
seg001:4C41 FE 80      cp      80h ; 'Ç'
seg001:4C43 38 01      jr      c, loc_0_4C46
seg001:4C45
seg001:4C45      loc_0_4C45:          ; CODE XREF: sub_0_4C2E+11↑j
seg001:4C45 12          ld      (de), a
seg001:4C46
seg001:4C46      loc_0_4C46:          ; CODE XREF: sub_0_4C2E+15↑j
seg001:4C46 1B          dec     de
seg001:4C47 2B          dec     hl
seg001:4C48 10 F1      djnz   loc_0_4C3B
seg001:4C4A E1          pop     hl
seg001:4C4B 11 40 00    ld      de, 40h ; '@'
seg001:4C4E ED 52      sbc     hl, de
seg001:4C50 CD 7E 4C    call   clear_video_line_HL
seg001:4C53 C1          pop     bc
seg001:4C54 C9          ret
seg001:4C54      ; End of function sub_0_4C2E
seg001:4C54
seg001:4C54
seg001:4C54
seg001:4C54      ; SUBROUTINE
seg001:4C54
seg001:4C54
seg001:4C54
seg001:4C54      sub_0_4C55:          ; CODE XREF: seg001:4BFA↑p
seg001:4C55 7C          ld      a, h
seg001:4C56 B7          or      a
seg001:4C57 C8          ret     z
seg001:4C58 D5          push    de
seg001:4C59 11 40 00    ld      de, 40h ; '@'
seg001:4C5C 19          add     hl, de
seg001:4C5D D1          pop     de
seg001:4C5E C9          ret
seg001:4C5E      ; End of function sub_0_4C55
seg001:4C5E
seg001:4C5E
seg001:4C5E
seg001:4C5E      ; SUBROUTINE
seg001:4C5E
seg001:4C5E
seg001:4C5E
seg001:4C5E      check_for_new_high_score:          ; CODE XREF: seg001:4951↑p
seg001:4C5F 21 C9 3F      ld      hl, 3FC9h          ; score
seg001:4C62 11 FA 3F      ld      de, 3FFAh          ; high score
seg001:4C65 06 04      ld      b, 4              ; 4 digits to compare
seg001:4C67
seg001:4C67      loc_0_4C67:          ; CODE XREF: check_for_new_high_score+10↑j
seg001:4C67 4E          ld      c, (hl)
seg001:4C68 1A          ld      a, (de)
seg001:4C69 B9          cp      c
seg001:4C6A 38 06      jr      c, update_high_score ; yes, skip
seg001:4C6C C0          ret     nz
seg001:4C6D 23          inc     hl

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seg001:4C6E 13      inc     de           ; next digits
seg001:4C6F 10 F6    djnz    loc_0_4C67    ; loop through all digits
seg001:4C71 C9      ret
seg001:4C72      ; -----
seg001:4C72      update_high_score:           ; CODE XREF: check_for_new_high_score+B|j
seg001:4C72 21 C9 3F    ld      hl, 3FC9h          ; source = score
seg001:4C75 11 FA 3F    ld      de, 3FFAh          ; destination = high score
seg001:4C78 01 05 00    ld      bc, 5              ; 5 digits to copy
seg001:4C7B ED B0    ldir                     ; copy
seg001:4C7D C9      ret
seg001:4C7D      ; End of function check_for_new_high_score
seg001:4C7D      ; -----
seg001:4C7E      ; SUBROUTINE
seg001:4C7E      clear_video_line_HL:           ; CODE XREF: sub_0_471C+94|p
seg001:4C7E      ; seg001:4948|p ...
seg001:4C7E      push     bc
seg001:4C7F D5      push     de
seg001:4C80 06 40    ld      b, 40h ; '@'          ; characters/line
seg001:4C82      loc_0_4C82:           ; CODE XREF: clear_video_line_HL+7|j
seg001:4C82      ld      (hl), 20h ; ' '      ; display space
seg001:4C84 23      inc     hl              ; next video address
seg001:4C85 10 FB    djnz    loc_0_4C82          ; clear a line
seg001:4C87 D1      pop      de
seg001:4C88 C1      pop      bc
seg001:4C89 C9      ret
seg001:4C89      ; End of function clear_video_line_HL
seg001:4C89      ; -----
seg001:4C8A      ; SUBROUTINE
seg001:4C8A      sub_0_4C8A:           ; CODE XREF: seg001:4F65|p
seg001:4C8A D9      exx
seg001:4C8B 06 04    ld      b, 4
seg001:4C8D DD 21 08 43 ld      ix, 4308h
seg001:4C91      loc_0_4C91:           ; CODE XREF: sub_0_4C8A+11|j
seg001:4C91      ld      a, (ix+1)
seg001:4C94 B7      or      a
seg001:4C95 20 08    jr      nz, loc_0_4C9F
seg001:4C97 DD 2B      dec     ix
seg001:4C99 DD 2B      dec     ix
seg001:4C9B 10 F4    djnz    loc_0_4C91
seg001:4C9D      loc_0_4C9D:           ; CODE XREF: sub_0_4C8A+3B|j
seg001:4C9D      ; sub_0_4C8A+4E|j ...
seg001:4C9D      exx
seg001:4C9E C9      ret
seg001:4C9F      ; -----
seg001:4C9F      loc_0_4C9F:           ; CODE XREF: sub_0_4C8A+B|j
seg001:4C9F      ld      hl, (word_0_4313)
seg001:4CA2 11 80 C0    ld      de, 0C080h
seg001:4CA5 19      add     hl, de
seg001:4CA6 EB      ex      de, hl
seg001:4CA7 DD 6E 00    ld      l, (ix+0)
seg001:4CAA DD 66 01    ld      h, (ix+1)
seg001:4CAD E5      push     hl
seg001:4CAE 21 03 00    ld      hl, 3
seg001:4CB1 CD 1D 4D    call    sub_0_4D1D
seg001:4CB4 7D      ld      a, l
seg001:4CB5 E1      pop      hl
seg001:4CB6 FE 01      cp      1
seg001:4CB8 20 4B      jr      nz, loc_0_4D05
seg001:4CBA      loc_0_4CBA:           ; CODE XREF: sub_0_4C8A+84|j
seg001:4CBA      add     hl, de
seg001:4CBB 11 80 FF    ld      de, 0FF80h
seg001:4CBE      loc_0_4CBE:           ; CODE XREF: sub_0_4C8A+39|j
seg001:4CBE      bit     7, (hl)
seg001:4CC0 20 05      jr      nz, loc_0_4CC7
seg001:4CC2 19      add     hl, de
seg001:4CC3 10 F9      djnz    loc_0_4CBE
seg001:4CC5 18 D6      jr      loc_0_4C9D
seg001:4CC7      ; -----
seg001:4CC7      loc_0_4CC7:           ; CODE XREF: sub_0_4C8A+36|j
seg001:4CC7 DD 21 EA 4E    ld      ix, 4EEAh
seg001:4CCB 06 04      ld      b, 4
seg001:4CCD      loc_0_4CCD:           ; CODE XREF: sub_0_4C8A+4C|j
seg001:4CCD      ld      a, (ix+1)
seg001:4CD0 B7      or      a
seg001:4CD1 28 08      jr      z, loc_0_4CDB
seg001:4CD3 CD 2A 4E    call    add_3_to_ix
seg001:4CD6 10 F5      djnz    loc_0_4CCD
seg001:4CD8 C3 9D 4C      jp      loc_0_4C9D
seg001:4CDB      ; -----
seg001:4CDB      loc_0_4CDB:           ; CODE XREF: sub_0_4C8A+47|j
seg001:4CDB      call    sub_0_4D28
seg001:4CDE 11 82 00    ld      de, 82h ; 'é'
seg001:4CE1 19      add     hl, de
seg001:4CE2 E5      push     hl
seg001:4CE3 21 03 00    ld      hl, 3
seg001:4CE6 CD 1D 4D    call    sub_0_4D1D
seg001:4CE9 11 D2 4E    ld      de, 4ED2h
seg001:4CEC 19      add     hl, de
seg001:4CED D1      pop      de
seg001:4CEE CB 7B      bit     7, e
seg001:4CF0 28 1E      jr      z, loc_0_4D10
seg001:4CF2      loc_0_4CF2:           ; CODE XREF: sub_0_4C8A+8A|j
seg001:4CF2      ld      a, (de)
seg001:4CF3 FE 20      cp      20h ; ' ',
seg001:4CF5 20 A6      jr      nz, loc_0_4C9D
seg001:4CF7 7E      ld      a, (hl)
seg001:4CF8 12      ld      (de), a
seg001:4CF9 DD 73 00    ld      (ix+0), e
seg001:4CFC DD 72 01    ld      (ix+1), d

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seg001:4CFF DD 77 02      ld      (ix+2), a
seg001:4D02 C3 9D 4C      jp      loc_0_4C9D
seg001:4D05
seg001:4D05
seg001:4D05      loc_0_4D05:                ; CODE XREF: sub_0_4C8A+2E↑j
seg001:4D05 E5          push     hl
seg001:4D06 21 40 00      ld      hl, 40h ; '@'
seg001:4D09 CD 1D 4D      call    sub_0_4D1D
seg001:4D0C EB          ex      de, hl
seg001:4D0D E1          pop     hl
seg001:4D0E 18 AA      jr      loc_0_4CBA
seg001:4D10
seg001:4D10
seg001:4D10      loc_0_4D10:                ; CODE XREF: sub_0_4C8A+66↑j
seg001:4D10 EB          ex      de, hl
seg001:4D11 CB 7E          bit     7, (hl)
seg001:4D13 EB          ex      de, hl
seg001:4D14 28 DC      jr      z, loc_0_4CF2
seg001:4D16 EB          ex      de, hl
seg001:4D17 E5          push     hl
seg001:4D18 D9          exx
seg001:4D19 E1          pop     hl
seg001:4D1A C3 10 48      jp      sub_0_4810
; End of function sub_0_4C8A
seg001:4D1A
seg001:4D1D
seg001:4D1D      ; SUBROUTINE
seg001:4D1D
seg001:4D1D
seg001:4D1D      sub_0_4D1D:                ; CODE XREF: sub_0_471C+9A↑p
seg001:4D1D D5          ; sub_0_471C+D2↑p ...
seg001:4D1D      push     de
seg001:4D1E C5          push     bc
seg001:4D1F CD CC 14      call    14CCh
seg001:4D22 CD 7F 0A      call    0A7Fh
seg001:4D25 C1          pop     bc
seg001:4D26 D1          pop     de
seg001:4D27 C9          ret
; End of function sub_0_4D1D
seg001:4D27
seg001:4D27
seg001:4D28
seg001:4D28      ; SUBROUTINE
seg001:4D28
seg001:4D28
seg001:4D28      sub_0_4D28:                ; CODE XREF: sub_0_471C+3F↑p
seg001:4D28 D5          ; sub_0_4C8A+51↑p
seg001:4D28      push     de
seg001:4D29 7E          ld      a, (hl)
seg001:4D2A E6 30      and     30h ; '0'
seg001:4D2C 11 C0 FF      ld      de, 0FFC0h
seg001:4D2F 20 01      jr      nz, loc_0_4D32
seg001:4D31 19          add     hl, de
seg001:4D32
seg001:4D32      loc_0_4D32:                ; CODE XREF: sub_0_4D28+7↑j
seg001:4D32 CB 7E          ; sub_0_4D28+D↑j
seg001:4D32      bit     7, (hl)
seg001:4D34 2B          dec     hl
seg001:4D35 20 FB      jr      nz, loc_0_4D32
seg001:4D37 23          inc     hl
seg001:4D38 23          inc     hl
seg001:4D39 D1          pop     de
seg001:4D3A C9          ret
; End of function sub_0_4D28
seg001:4D3A
seg001:4D3A
seg001:4D3B
seg001:4D3B      ; SUBROUTINE
seg001:4D3B
seg001:4D3B
seg001:4D3B      sub_0_4D3B:                ; CODE XREF: seg001:4AC4↑p
seg001:4D3B 21 00 3C      ld      hl, 3C00h
seg001:4D3E 01 C0 03      ld      bc, 3C0h
seg001:4D41
seg001:4D41      loc_0_4D41:                ; CODE XREF: sub_0_4D3B+16↑j
seg001:4D41 CB 7E          bit     7, (hl)
seg001:4D43 28 05      jr      z, loc_0_4D4A
seg001:4D45 7E          ld      a, (hl)
seg001:4D46 FE 80      cp      80h ; 'Q'
seg001:4D48 20 02      jr      nz, loc_0_4D4C
seg001:4D4A
seg001:4D4A      loc_0_4D4A:                ; CODE XREF: sub_0_4D3B+8↑j
seg001:4D4A 36 20      ld      (hl), 20h ; ' '
seg001:4D4C
seg001:4D4C      loc_0_4D4C:                ; CODE XREF: sub_0_4D3B+D↑j
seg001:4D4C 23          inc     hl
seg001:4D4D 0B          dec     bc
seg001:4D4E 78          ld      a, b
seg001:4D4F B1          or      c
seg001:4D50 C8          ret     z
seg001:4D51 18 EE      jr      loc_0_4D41
; End of function sub_0_4D3B
seg001:4D51
seg001:4D51
seg001:4D53
seg001:4D53      ; SUBROUTINE
seg001:4D53
seg001:4D53
seg001:4D53      sub_0_4D53:                ; CODE XREF: sub_0_4D5F+20↑p
seg001:4D53 AF          ; sub_0_4D5F+60↑p ...
seg001:4D53      xor      a
seg001:4D54 DD 77 01      ld      (ix+1), a
seg001:4D57
seg001:4D57      loc_0_4D57:                ; CODE XREF: sub_0_4810+1B↑j
seg001:4D57 3A 12 43      ld      a, (byte_0_4312)
seg001:4D5A 3D          dec     a
seg001:4D5B 32 12 43      ld      (byte_0_4312), a
seg001:4D5E C9          ret
; End of function sub_0_4D53
seg001:4D5E
seg001:4D5E
seg001:4D5F
seg001:4D5F      ; SUBROUTINE
seg001:4D5F
seg001:4D5F
seg001:4D5F      sub_0_4D5F:                ; CODE XREF: seg001:4F61↑p
seg001:4D5F D9          exx
seg001:4D60 DD 21 EA 4E      ld      ix, 4EEAh
seg001:4D64 06 04      ld      b, 4
seg001:4D66

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seg001:4D66      loc_0_4D66:      ; CODE XREF: sub_0_4D5F+10↑j
seg001:4D66 DD 7E 01      ld      a, (ix+1)
seg001:4D69 B7          or      a
seg001:4D6A 20 07      jr      nz, loc_0_4D73
seg001:4D6C      loc_0_4D6C:      ; CODE XREF: sub_0_4D5F+23↑j
seg001:4D6C CD 2A 4E      ; sub_0_4D5F+4B↑j ...
seg001:4D6C      call    add_3_to_ix
seg001:4D6F 10 F5      djnz   loc_0_4D66
seg001:4D71 D9          exx
seg001:4D72 C9          ret
seg001:4D73      ;
seg001:4D73      loc_0_4D73:      ; CODE XREF: sub_0_4D5F+B↑j
seg001:4D73      ld      l, (ix+0)
seg001:4D76 DD 6E 00      ld      h, (ix+1)
seg001:4D79 DD 7E 02      ld      a, (ix+2)
seg001:4D7C BE          cp      (hl)
seg001:4D7D 28 05      jr      z, loc_0_4D84
seg001:4D7F CD 53 4D      call    sub_0_4D53
seg001:4D82 18 E8      jr      loc_0_4D6C
seg001:4D84      ;
seg001:4D84      loc_0_4D84:      ; CODE XREF: sub_0_4D5F+1E↑j
seg001:4D84      ld      (hl), 20h ; ' '
seg001:4D86 11 40 00      ld      de, 40h ; '@'
seg001:4D89 19          add     hl, de
seg001:4D8A DD 75 00      ld      (ix+0), l
seg001:4D8D DD 74 01      ld      (ix+1), h
seg001:4D90 E5          push    hl
seg001:4D91 11 C0 3F      ld      de, 3FC0h
seg001:4D94 CD E2 45      call    sub_0_45E2
seg001:4D97 B7          or      a
seg001:4D98 F5          push    af
seg001:4D99 20 2D      jr      nz, loc_0_4DC8
seg001:4D9B F1          pop     af
seg001:4D9C E1          pop     hl
seg001:4D9D 7E          ld      a, (hl)
seg001:4D9E FE 5B      cp      5Bh ; '['
seg001:4DA0 28 0A      jr      z, loc_0_4DAC
seg001:4DA2 FE 81      cp      81h ; 'ü'
seg001:4DA4 30 35      jr      nc, loc_0_4DDB
seg001:4DA6 DD 7E 02      ld      a, (ix+2)
seg001:4DA9 77          ld      (hl), a
seg001:4DAA 18 C0      jr      loc_0_4D6C
seg001:4DAC      ;
seg001:4DAC      loc_0_4DAC:      ; CODE XREF: sub_0_4D5F+41↑j
seg001:4DAC      push    hl
seg001:4DAD F5          push    af
seg001:4DAE 21 03 00      ld      hl, 3
seg001:4DB1 CD 1D 4D      call    sub_0_4D1D
seg001:4DB4 7D          ld      a, l
seg001:4DB5 FE 02      cp      2
seg001:4DB7 38 0F      jr      c, loc_0_4DC8
seg001:4DB9 20 14      jr      nz, loc_0_4DCF
seg001:4DBB AF          xor     a
seg001:4DBC 32 11 43      ld      (byte_0_4311), a
seg001:4DBF CD 53 4D      call    sub_0_4D53
seg001:4DC2 F1          pop     af
seg001:4DC3 E1          pop     hl
seg001:4DC4 36 20      ld      (hl), 20h ; ' '
seg001:4DC6 18 A4      jr      loc_0_4D6C
seg001:4DC8      ;
seg001:4DC8      loc_0_4DC8:      ; CODE XREF: sub_0_4D5F+3A↑j
seg001:4DC8      ; sub_0_4D5F+58↑j ...
seg001:4DC8 CD 53 4D      call    sub_0_4D53
seg001:4DCB F1          pop     af
seg001:4DCC E1          pop     hl
seg001:4DCD 18 9D      jr      loc_0_4D6C
seg001:4DCF      ;
seg001:4DCF      loc_0_4DCF:      ; CODE XREF: sub_0_4D5F+5A↑j
seg001:4DCF      xor     a
seg001:4DD0 32 11 43      ld      (byte_0_4311), a
seg001:4DD3 F1          pop     af
seg001:4DD4 E1          pop     hl
seg001:4DD5 DD 7E 02      ld      a, (ix+2)
seg001:4DD8 77          ld      (hl), a
seg001:4DD9 18 91      jr      loc_0_4D6C
seg001:4DDB      ;
seg001:4DDB      loc_0_4DDB:      ; CODE XREF: sub_0_4D5F+45↑j
seg001:4DDB      ex      de, hl
seg001:4DDC CD 4A 48      call    sub_0_484A
seg001:4DDF CD E2 45      call    sub_0_45E2
seg001:4DE2 EB          ex      de, hl
seg001:4DE3 E5          push    hl
seg001:4DE4 F5          push    af
seg001:4DE5 FE FF      cp      0FFh
seg001:4DE7 28 DF      jr      z, loc_0_4DC8
seg001:4DE9 F1          pop     af
seg001:4DEA E1          pop     hl
seg001:4DEB 11 80 3F      ld      de, 3F80h
seg001:4DEE CD E2 45      call    sub_0_45E2
seg001:4DF1 B7          or      a
seg001:4DF2 C2 27 4B      jp      nz, loc_0_4B27
seg001:4DF5 CD 10 48      call    sub_0_4810
seg001:4DF8 E5          push    hl
seg001:4DF9 F5          push    af
seg001:4DFA 18 CC      jr      loc_0_4DC8
seg001:4DFA      ; End of function sub_0_4D5F
seg001:4DFA      ;
seg001:4DFA      ; SUBROUTINE
seg001:4DFC      ;
seg001:4DFC      sub_0_4DFC:      ; CODE XREF: seg001:4EFB↑p
seg001:4DFC      ld      hl, 4EEAh
seg001:4DFF 11 EB 4E      ld      de, 4EEBh
seg001:4E02 01 0C 00      ld      bc, 0Ch
seg001:4E05 36 00      ld      (hl), 0
seg001:4E07 ED B0      ldir
seg001:4E09 C9          ret
seg001:4E09      ; End of function sub_0_4DFC

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seg001:4E09
seg001:4E0A
seg001:4E0A
seg001:4E0A
seg001:4E0A
seg001:4E0A
seg001:4E0A E5
seg001:4E0B D9
seg001:4E0C D1
seg001:4E0D DD 21 EA 4E
seg001:4E11 06 04
seg001:4E13
seg001:4E13
seg001:4E13 DD 6E 00
seg001:4E16 DD 66 01
seg001:4E19 CD E2 45
seg001:4E1C FE 20
seg001:4E1E CA 26 4E
seg001:4E21 CD 2A 4E
seg001:4E24 10 ED
seg001:4E26
seg001:4E26
seg001:4E26 D9
seg001:4E27 C3 53 4D
seg001:4E27
seg001:4E27
seg001:4E2A
seg001:4E2A
seg001:4E2A
seg001:4E2A
seg001:4E2A DD 23
seg001:4E2A
seg001:4E2C DD 23
seg001:4E2E DD 23
seg001:4E30 C9
seg001:4E30
seg001:4E30
seg001:4E31
seg001:4E31
seg001:4E31
seg001:4E31
seg001:4E31
seg001:4E31 CD 18 45
seg001:4E34 21 19 3E
seg001:4E37 06 32
seg001:4E39
seg001:4E39
seg001:4E39 C5
seg001:4E3A 22 20 40
seg001:4E3D E5
seg001:4E3E 21 D6 4E
seg001:4E41 CD E5 44
seg001:4E44 CD 5A 4E
seg001:4E47 E1
seg001:4E48 22 20 40
seg001:4E4B E5
seg001:4E4C 21 E0 4E
seg001:4E4F CD E5 44
seg001:4E52 CD 5A 4E
seg001:4E55 E1
seg001:4E56 C1
seg001:4E57 10 E0
seg001:4E59 C9
seg001:4E59
seg001:4E59
seg001:4E5A
seg001:4E5A
seg001:4E5A
seg001:4E5A
seg001:4E5A
seg001:4E5A 01 E8 03
seg001:4E5A
seg001:4E5D C3 60 00
seg001:4E5D
seg001:4E5D
seg001:4E60
seg001:4E60
seg001:4E60
seg001:4E60
seg001:4E60
seg001:4E60 01 64 00
seg001:4E60
seg001:4E63 C3 60 00
seg001:4E63
seg001:4E63
seg001:4E66
seg001:4E66
seg001:4E66
seg001:4E66
seg001:4E66
seg001:4E66 E5
seg001:4E66
seg001:4E66 DD E1
seg001:4E69
seg001:4E69
seg001:4E69 DD 7E 00
seg001:4E69
seg001:4E6C B7
seg001:4E6D C8
seg001:4E6E FE 09
seg001:4E70 20 0E
seg001:4E72 DD 6E 01
seg001:4E75 DD 66 02
seg001:4E78 22 20 40
seg001:4E7B CD 2A 4E
seg001:4E7E 18 E9
seg001:4E80
seg001:4E80
seg001:4E80
seg001:4E80 CD 33 00
seg001:4E83 01 00 05
seg001:4E86 CD 60 00
seg001:4E89 CD D9 45
seg001:4E8C DD 23
seg001:4E8E 18 D9

; SUBROUTINE

sub_0_4E0A:
; CODE XREF: sub_0_471C+DA|p
push hl
exx
pop de
ld ix, 4EEAh
ld b, 4

loc_0_4E13:
; CODE XREF: sub_0_4E0A+1A|j
ld l, (ix+0)
ld h, (ix+1)
call sub_0_45E2
cp 20h ; ' '
jp z, loc_0_4E26
call add_3_to_ix
djnz loc_0_4E13

loc_0_4E26:
; CODE XREF: sub_0_4E0A+14|j
exx
jp sub_0_4D53
; End of function sub_0_4E0A

; SUBROUTINE

add_3_to_ix:
; CODE XREF: sub_0_4C8A+49|p
; sub_0_4D5F+D|p ...
inc ix
inc ix
inc ix
ret
; End of function add_3_to_ix

; SUBROUTINE

display_GOOD_LUCK:
; CODE XREF: seg001:49F2|p
call wipe_screen_left_to_right_slow
ld hl, 3E19h
ld b, 50
; cursor position
; flash 50 times

loc_0_4E39:
; CODE XREF: display_GOOD_LUCK+26|j
push bc
ld (4020h), hl
; current cursor position
push hl
ld hl, aGoodLuck
; "GOOD LUCK"
call display_message
call delay_15ms
pop hl
; cursor position
ld (4020h), hl
push hl
ld hl, blank_x9
call display_message
call delay_15ms
pop hl
pop bc
djnz loc_0_4E39
; loop though all flashes
ret
; End of function display_GOOD_LUCK

; SUBROUTINE

delay_15ms:
; CODE XREF: sub_0_471C+59|p
; display_GOOD_LUCK+13|p ...
ld bc, 3E8h
; ~15ms
jp 60h
; delay
; End of function delay_15ms

; SUBROUTINE

delay_1_5ms:
; CODE XREF: wipe_screen_left_to_right_slow+14|p
; seg001:4F76|p
; ~1.5ms
ld bc, 64h ; 'd'
jp 60h
; delay
; End of function delay_1_5ms

; SUBROUTINE

print_slow_and_check_for_R_key:
; CODE XREF: seg001:4567|p
; seg001:45A3|p ...
; ptr message
push hl
pop ix

loc_0_4E69:
; CODE XREF: print_slow_and_check_for_R_key+18|j
; print_slow_and_check_for_R_key+28|j
ld a, (ix+0)
or a
ret z
; done?
; yes, exit
cp 9
; cursor position embedded?
jr nz, loc_0_4E80
; no, skip
ld l, (ix+1)
ld h, (ix+2)
; cursor position
ld (4020h), hl
; set ROM variable
call add_3_to_ix
jr loc_0_4E69
; next character

loc_0_4E80:
; CODE XREF: print_slow_and_check_for_R_key+A|j
; display character
call 33h
; ~20ms
ld bc, 500h
call 60h
; delay
call check_for_R_key
inc ix
; next character
jr loc_0_4E69
; loop

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seg001:4E8E      ; End of function print_slow_and_check_for_R_key
seg001:4E8E
seg001:4E90
seg001:4E90      ; SUBROUTINE
seg001:4E90
seg001:4E90
seg001:4E90      display_lives_left:      ; CODE XREF: update_score_and_chk_bonus_life+24|p
seg001:4E90      ; seg001:49E9|p ...
seg001:4E90 E5      push    hl
seg001:4E90      push    de
seg001:4E91 D5      push    bc
seg001:4E92 C5      push    af
seg001:4E93 F5      ld      hl, (4020h)      ; current cursor position
seg001:4E94 2A 20 40      push    hl
seg001:4E97 E5      ld      hl, 3FD0h      ; cursor position
seg001:4E98 21 D0 3F      ld      (4020h), hl
seg001:4E9B 22 20 40      ld      a, (no_lives)
seg001:4E9E 3A 0F 43      dec     a      ; any lives left?
seg001:4EA1 3D      jr      z, wipe_all_ship_icons
seg001:4EA2 28 14      ld      b, a      ; number of lives
seg001:4EA4 47      ; CODE XREF: display_lives_left+1B|j
seg001:4EA5      loc_0_4EA5:
seg001:4EA5      ld      hl, mini_player
seg001:4EA8 CD E5 44      call   display_message
seg001:4EAB 10 F8      djnz   loc_0_4EA5
seg001:4EAD 3A 0F 43      ld      a, (no_lives)
seg001:4EB0 47      ld      b, a
seg001:4EB1 3E 04      ld      a, 4
seg001:4EB3 90      sub     b      ; no. icons to wipe
seg001:4EB4 28 0C      jr      z, loc_0_4EC2      ; none, skip
seg001:4EB6 18 02      jr      wipe_ship_icons
seg001:4EB8
seg001:4EB8      wipe_all_ship_icons:      ; CODE XREF: display_lives_left+12|j
seg001:4EB8      ld      b, 3      ; max 3 ship icons
seg001:4EBA
seg001:4EBA      wipe_ship_icons:      ; CODE XREF: display_lives_left+26|j
seg001:4EBA      ; display_lives_left+30|j
seg001:4EBA      ld      hl, blank_x3
seg001:4EBD CD E5 44      call   display_message
seg001:4EC0 10 F8      djnz   wipe_ship_icons
seg001:4EC2
seg001:4EC2      loc_0_4EC2:      ; CODE XREF: display_lives_left+24|j
seg001:4EC2 E1      pop     hl
seg001:4EC3 22 20 40      ld      (4020h), hl      ; restore cursor position
seg001:4EC6 F1      pop     af
seg001:4EC7 C1      pop     bc
seg001:4EC8 D1      pop     de
seg001:4EC9 E1      pop     hl
seg001:4ECA C9      ret
seg001:4ECA      ; End of function display_lives_left
seg001:4ECA
seg001:4ECA      ;
seg001:4ECB 20 20 20 00 blank_x3: .db 20h, 20h, 20h, 0      ; DATA XREF: display_lives_left+2A|o
seg001:4ECF 88 8E 8C 00 mini_player: .db 88h, 8Eh, 8Ch, 0      ; DATA XREF: display_lives_left+15|o
seg001:4ED3 5C      .db 5Ch ; \
seg001:4ED4 56      .db 56h ; V
seg001:4ED5 2A      .db 2Ah ; *
seg001:4ED6 47 4F 4F 44+aGoodLuck: .text "GOOD LUCK"      ; DATA XREF: display_GOOD_LUCK+D|o
seg001:4ED6 20 4C 55 43+      .db 0
seg001:4EE0 20 20 20 20+blank_x9: .db 20h, 20h, 20h, 20h, 20h, 20h, 20h, 20h, 20h, 0
seg001:4EE0 20 20 20 20+      ; DATA XREF: display_GOOD_LUCK+1B|o
seg001:4EEA D1      .db 0D1h ; D
seg001:4EEB 3E      .db 3Eh ; >
seg001:4EEC 56      .db 56h ; V
seg001:4EED DF      .db 0DFh ; █
seg001:4EEE 00      .db 0 ;
seg001:4EEF 56      .db 56h ; V
seg001:4EF0 92      .db 92h ; Å
seg001:4EF1 3F      .db 3Fh ; ?
seg001:4EF2 56      .db 56h ; V
seg001:4EF3 00      .db 0 ;
seg001:4EF4 00      .db 0 ;
seg001:4EF5 00      .db 0 ;
seg001:4EF6 00      .db 0 ;
seg001:4EF7 00      .db 0 ;
seg001:4EF8 00      .db 0 ;
seg001:4EF9 00      .db 0 ;
seg001:4EFA 00      .db 0 ;
seg001:4EFB
seg001:4EFB      ;
seg001:4EFB      loc_0_4EFB:      ; CODE XREF: seg001:4AAD|j
seg001:4EFB      call   sub_0_4DFC
seg001:4EFE AF      xor     a
seg001:4EFF 32 12 43      ld      (byte_0_4312), a
seg001:4F02 32 20 43      ld      (byte_0_4320), a
seg001:4F05
seg001:4F05      loc_0_4F05:      ; CODE XREF: seg001:4F95|j
seg001:4F05      ld      a, (3840h)      ; read keyboard
seg001:4F08 57      ld      d, a
seg001:4F09 01 00 02      ld      bc, 200h
seg001:4F0C CD 60 00      call   60h      ; delay
seg001:4F0F 3A 40 38      ld      a, (3840h)      ; read keyboard
seg001:4F12 AA      xor     d
seg001:4F13 E6 80      and     80h ; 'Ç'
seg001:4F15 20 0F      jr      nz, loc_0_4F26      ; space - changed state?
seg001:4F17 3A 22 43      ld      a, (byte_0_4322)
seg001:4F1A 5F      ld      e, a
seg001:4F1B AA      xor     d
seg001:4F1C A2      and     d
seg001:4F1D E6 80      and     80h ; 'Ç'
seg001:4F1F 7A      ld      a, d
seg001:4F20 32 22 43      ld      (byte_0_4322), a
seg001:4F23 C4 E5 46      call   nz, sub_0_46E5
seg001:4F26
seg001:4F26      loc_0_4F26:      ; CODE XREF: seg001:4F15|j
seg001:4F26      ld      a, (byte_0_4320)
seg001:4F29 E6 03      and     3
seg001:4F2B CC 88 48      call   z, sub_0_4888
seg001:4F2E 3A 11 43      ld      a, (byte_0_4311)
seg001:4F31 B7      or      a
seg001:4F32 28 08      jr      z, loc_0_4F3C
seg001:4F34 3A 20 43      ld      a, (byte_0_4320)
seg001:4F37 E6 03      and     3
seg001:4F39 CC 1C 47      call   z, sub_0_471C
seg001:4F3C

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seg001:4F3C      loc_0_4F3C:      ; CODE XREF: seg001:4F32↑j
seg001:4F3C      ld      a, (byte_0_4320)
seg001:4F3F E6 07      and     7
seg001:4F41 CC F6 48      call    z, sub_0_48F6
seg001:4F44 CD BF 48      call    sub_0_48BF
seg001:4F47 3A 10 43      ld      a, (byte_0_4310)
seg001:4F4A B7          or      a
seg001:4F4B 20 0D      jr      nz, loc_0_4F5A
seg001:4F4D 3A 0C 43      ld      a, (byte_0_430C)
seg001:4F50 FE 80      cp      80h ; 'Ç'
seg001:4F52 20 06      jr      nz, loc_0_4F5A
seg001:4F54 21 00 3C      ld      hl, 3C00h
seg001:4F57 CD 7E 4C      call    clear_video_line_HL
seg001:4F5A      loc_0_4F5A:      ; CODE XREF: seg001:4F4B↑j
seg001:4F5A 00          ; seg001:4F52↑j
seg001:4F5A      nop
seg001:4F5B 3A 20 43      ld      a, (byte_0_4320)
seg001:4F5E E6 0F      and     0Fh
seg001:4F60 F5          push    af
seg001:4F61 CC 5F 4D      call    z, sub_0_4D5F
seg001:4F64 F1          pop     af
seg001:4F65 CC 8A 4C      call    z, sub_0_4C8A
seg001:4F68 21 20 43      ld      hl, 4320h
seg001:4F6B 34          inc     (hl)
seg001:4F6C 3A 21 43      ld      a, (byte_0_4321)
seg001:4F6F 3D          dec     a
seg001:4F70 F5          push    af
seg001:4F71 CC 48 4B      call    z, sub_0_4B48
seg001:4F74 F1          pop     af
seg001:4F75 F5          push    af
seg001:4F76 C4 60 4E      call    nz, delay_1_5ms
seg001:4F79 F1          pop     af
seg001:4F7A 20 06      jr      nz, loc_0_4F82
seg001:4F7C 3A 01 43      ld      a, (invaders_left)
seg001:4F7F 87          add     a, a
seg001:4F80 D6 01      sub     1
seg001:4F82      loc_0_4F82:      ; CODE XREF: seg001:4F7A↑j
seg001:4F82      ld      (byte_0_4321), a
seg001:4F85 3A 11 43      ld      a, (byte_0_4311)
seg001:4F88 B7          or      a
seg001:4F89 20 0A      jr      nz, loc_0_4F95
seg001:4F8B 3A 00 43      ld      a, (byte_0_4300)
seg001:4F8E B7          or      a
seg001:4F8F 28 04      jr      z, loc_0_4F95
seg001:4F91 3D          dec     a
seg001:4F92 32 00 43      ld      (byte_0_4300), a
seg001:4F95      loc_0_4F95:      ; CODE XREF: seg001:4F89↑j
seg001:4F95 C3 05 4F      ; seg001:4F8F↑j
seg001:4F95      jp      loc_0_4F05
seg001:4F95      ;
seg001:4F98 43 4F 50 59+aCopyrightC1979;.text "COPYRIGHT (C) 1979, "
seg001:4FAC B0          .db 0B0h ; 0
seg001:4FAD 37          .db 37h ; 7
seg001:4FAE 2F          .db 2Fh ; /
seg001:4FAF 31          .db 31h ; 1
seg001:4FB0 33          .db 33h ; 3
seg001:4FB1 42          .db 42h ; B
seg001:4FB2 59          .db 59h ; Y
seg001:4FB3 20          .db 20h ;
seg001:4FB4 54          .db 54h ; T
seg001:4FB5 52          .db 52h ; R
seg001:4FB6 53          .db 53h ; S
seg001:4FB7 2D          .db 2Dh ; -
seg001:4FB8 42          .db 42h ; B
seg001:4FB9 4D          .db 4Dh ; M
seg001:4FBA 20          .db 20h ;
seg001:4FBB 4B          .db 4Bh ; K
seg001:4FBC 4F          .db 4Fh ; O
seg001:4FBD 47          .db 47h ; G
seg001:4FBE 41          .db 41h ; A
seg001:4FBF 4E          .db 4Eh ; N
seg001:4FC0 45          .db 45h ; E
seg001:4FC1 49          .db 49h ; I
seg001:4FC2 00          .db 0 ;
seg001:4FC3 81          .db 81h ; ù
seg001:4FC4 5F          .db 5Fh ; _
seg001:4FC5 7A          .db 7Ah ; z
seg001:4FC6 FE          .db 0FEh ; ■
seg001:4FC7 30          .db 30h ; 0
seg001:4FC8 28          .db 28h ; (
seg001:4FC9 02          .db 2 ;
seg001:4FCA 77          .db 77h ; w
seg001:4FCB 23          .db 23h ; #
seg001:4FCC 7B          .db 7Bh ; {
seg001:4FCD 0E          .db 0Eh ;
seg001:4FCE 0A          .db 0Ah ;
seg001:4FCF 10          .db 10h ;
seg001:4FD0 EC          .db 0ECh ; Ÿ
seg001:4FD1 C6          .db 0C6h ; ā
seg001:4FD2 30          .db 30h ; 0
seg001:4FD3 77          .db 77h ; w
seg001:4FD4 23          .db 23h ; #
seg001:4FD5 36          .db 36h ; 6
seg001:4FD6 03          .db 3 ;
seg001:4FD7 E1          .db 0E1h ; Š
seg001:4FD8 06          .db 6 ;
seg001:4FD9 20          .db 20h ;
seg001:4FDA 3E          .db 3Eh ; >
seg001:4FDB 00          .db 0 ;
seg001:4FDC 3D          .db 3Dh ; =
seg001:4FDD 20          .db 20h ;
seg001:4FDE 04          .db 4 ;
seg001:4FDF 77          .db 77h ; w
seg001:4FE0 23          .db 23h ; #
seg001:4FE1 10          .db 10h ;
seg001:4FE2 FC          .db 0FCh ; ³
seg001:4FE3 AF          .db 0AFh ; »
seg001:4FE4 C9          .db 0C9h ; ₯
seg001:4FE5 3A          .db 3Ah ; :
seg001:4FE6 C4          .db 0C4h ; —
seg001:4FE7 4E          .db 4Eh ; N
seg001:4FE8 6F          .db 6Fh ; o
seg001:4FE9 CB          .db 0CBh ; ₮

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seg001:4FEA A6      .db 0A6h ; a
seg001:4FEB 5A      .db 5Ah ; Z
seg001:4FEC 23      .db 23h ; #
seg001:4FED 56      .db 56h ; V
seg001:4FEE CD      .db 0CDh ; =
seg001:4FEF 82      .db 82h ; é
seg001:4FF0 4E      .db 4Eh ; N
seg001:4FF1 7B      .db 7Bh ; {
seg001:4FF2 0F      .db 0Fh ;
seg001:4FF3 0F      .db 0Fh ;
seg001:4FF4 0F      .db 0Fh ;
seg001:4FF5 E6      .db 0E6h ; µ
seg001:4FF6 1F      .db 1Fh ;
seg001:4FF7 C5      .db 0C5h ; †
seg001:4FF8 21      .db 21h ; !
seg001:4FF9 C0      .db 0C0h ; L
seg001:4FFA 4D      .db 4Dh ; M
seg001:4FFB 4F      .db 4Fh ; O
seg001:4FFC 06      .db 6 ;
seg001:4FFD 00      .db 0 ;
seg001:4FFE 09      .db 9 ;
seg001:4FFF 7B      .db 7Bh ; {
seg001:4FFF      ; end of 'seg001'
seg001:4FFF
seg001:4FFF
seg001:4FFF
seg001:4FFF      .end

```