The second level of Carlos has three black bars that prevent game progression.

Figure 1: Screenshot Level 2 (issue)

In Carlos (and Nicky Boom 1 and 2, games sharing the same engine), the level map is stored in a .CDG file. The .CDG contains the tilemap where each byte :

- indexes a .BLK file for the tile bitmap - 16x16 pixels
- indexes a .REF file for the flags (eg. collidable) - 8 bytes long

The tilemap is stored vertically, an offset to a tile is equal to `x * tilemap_h + y`.

The coordinates of the three black bars are (258,45), (267,45) and (271,45). The tile index is 0x19 which corresponds to a fully black tile.

Figure 2: Level 2 tiles

0x19 appears to be the value set for tiles that correspond to game triggers. For example, the gate between the first and second black bars is also equal to 0x19. The coordinate for the gate is (261,45) and is correctly drawn by the game engine.

The POSIT.REF file contains the list of triggers and objects for a level. We can find reference to this gate and the switch that activates it :

```
pos 264,43 tile 0xd3 ref 0x95 op_collide 20 op_logic 0 ; switch
```

When the player reaches the switch at (264,43), the collide opcode 20 is executed.

```
game_update_object_tilemap pos 261,44 w 1 h 5
```

In that case, the opcode 20 will update the (1x5) tiles from (261,44) ; basically opening the gate.

We can do the same for the 3 vertical black bars and iterate through the list of triggers for coordinates matching (258,44) or (267,44) or (271,44). None can be found. It appears the game shipped with these black bars that cannot be disabled by regular game play.

A possible fix is to replace these 4 vertical bars tiles with regular backgrounds tiles. Replace `0x19 0x19 0x19 0x19` with `0xBF 0xA8 0xA8 0xA8` at offsets 0x3291, 0x3453 and 0x351b in the uncompressed AA2CDG file.

Figure 3: Screenshot Level 2 (fixed)