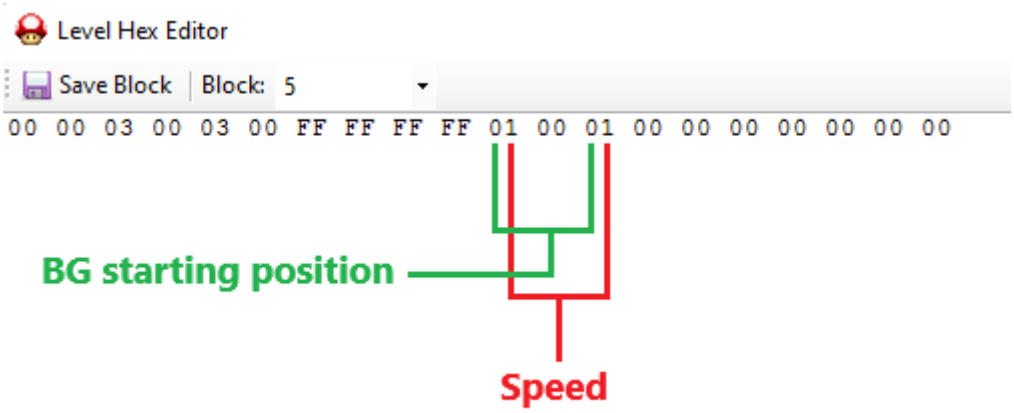
Background Scrolling Data Info

> TODO:
> - Verify info for BG start position nybble — 0x2 and 0x3 in particular.
> - How specifically do "Disable vertical scrolling" and "Automatic horizontal scrolling" work? What all do bytes 13 and 16 do?
> - Might be nice to list which BG speeds and such are all used.

Foregrounds and backgrounds scroll differently in many levels — sometimes they have a fast speed ratio and sometimes they can be completely static. This can be adjusted by hex editing your level.

- **Bottom background** --> Change block 3.
- **Top background** --> Change block 5.



- Byte 11: Control BG horizontal scrolling.
- Byte 13: Control BG vertical scrolling.

And for each byte:

- First Nybble: Controls where the background starts relative to the view and how it loops. This seemingly does nothing for horizontal looping or start position.
- Second Nybble: Controls scroll speed relative to stage foreground speed.

(*Image source: MarioSunshine*)

Start position and loop data

- 0x0: Starts from bottom of view offset by 32px; loops entire background.
- 0x1: Starts from top of view offset by 32px; loops entire background.
- 0x2: Duplicate of 0x0?
- 0x3: Duplicate of 0x1?
- 0x4: Starts from bottom of view offset by 32px; loops top half of background.
- 0x5: Starts from top of view offset by 32px; loops bottom half of background.

Any value higher than 0x5 freezes the game.

Scroll speed data

Table address in overlay 0: `0x0002F468`
Table address in memory: `0x020C7B48`

- 0x0: Same as FG speed. Used in w2-3 (sewer level) for example.
- 0x1: 50% FG speed.
- 0x2: 25% FG speed. Common for top backgrounds.
- 0x3: 12.5% FG speed. Common for bottom backgrounds.
- 0x4: 120% FG speed. Unused.
- 0x5: 75% FG speed.
- 0x6: 6.25% FG speed.
- 0x7: 9.375% FG speed.
- 0x8: 20.3125% FG speed.
- 0x9: Same as FG speed.
- 0xA: Same as FG speed.
- 0xB: Same as FG speed.
- 0xC: Same as FG speed.
- 0xD: 200% FG speed. Unused.
- 0xE: 400% FG speed. Unused.
- 0xF: 800% FG speed. Unused.

(*Source: RoadrunnerWMC*)

Disabling vertical scrolling

- **Bottom background** --> Change both bytes 13 and 16 of block 3.
- **Top background** --> Change both bytes 13 and 16 of block 5.

- Byte 13: set to 0x40.
- Byte 16: set to 0x10.

(*Source: MeroMero*)

Automatic horizontal scrolling

Works for any background that already has parallax scrolling. This can be achieved by putting a value of 0x10 for byte 16 and it will scroll the whole background instead of only some of it.

(Note: if byte 13 value is somewhere between 0x40 and 0x4F, this effect will be overridden and instead the vertical scrolling will be disabled).

(*Source: MeroMero*)

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