The Schematics have been analyzed from a die picture by InfosecDJ.
The chip is identified as:

It is a MSM79V000 gate array from the MSM70V000 series. — 3289 Basic Cells — 23 Columns, 143 Rows

The konami 007781 is a tilemap pixel shift register with scroll. The tiles are 8x8 pixels, but the 007781 don't care about vertical line position. 007781 handles two tilemaps at a time:

— V1, tilemap 1

— V2, tilemap 2

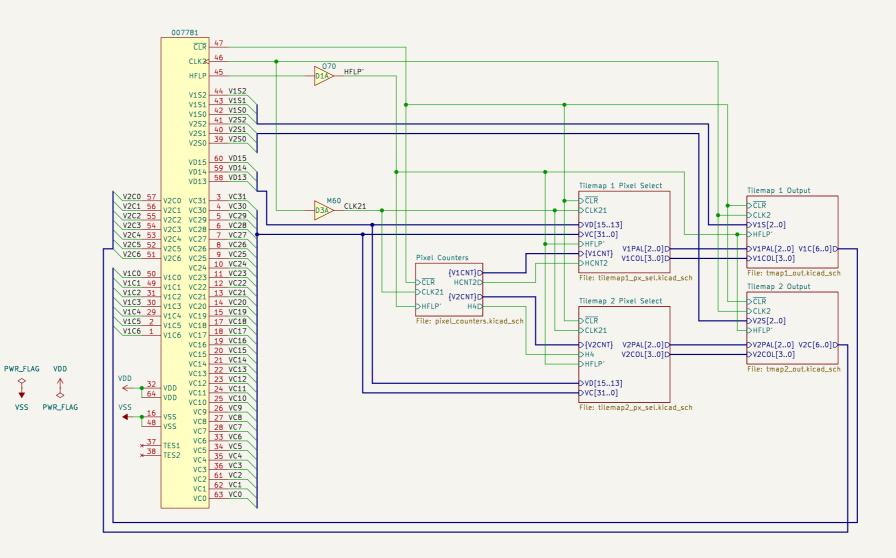
8 pixels, 4 bits each, of color data at a time are latched into the registers. The palette code is latched 8 pixel clocks earlier from VRAM. This is because the data in the 007780 DRAM controller and DRAM takes 8 pixel clocks to process.

V1 latches pixels when the horizontal counter, going from 0 to 7, goes to 2 (HCNT2) and V2 latches when the horizontal counter goes to 4. Data latched for:

- V1. when HCNT[2:0] == 2

- V2, when HCNT[2:0] == 4

The pixel code and palette color data are shifted out between 1 to 9 pixel clocks after HCNT[2:0] == 4, depending on if scroll or horizontal flip are active.



Ulf Skutnabba, twitter: @skutis77 Sheet: / File: 007781.kicad_sch Title: Konami 007781 Date: 2024-09-08 KiCad E.D.A. 8.0.5

