

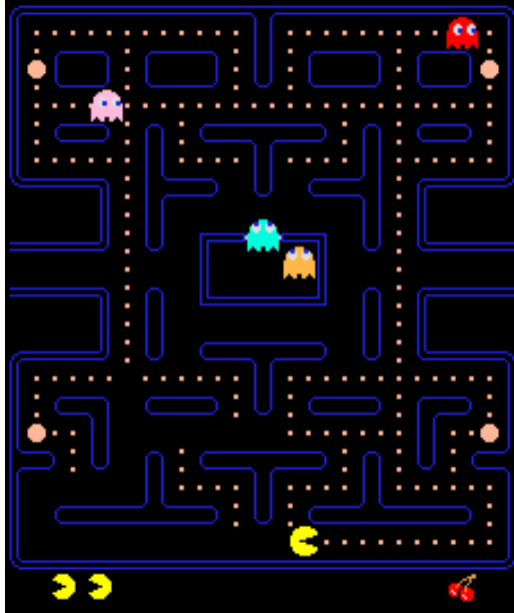
Sprite Graphics

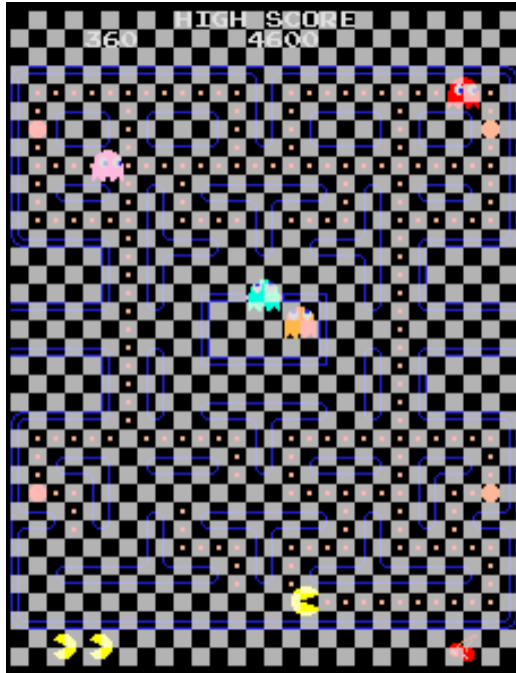
Stephen A. Edwards

Columbia University

Spring 2025

360 HIGH SCORE 4600





MARIO
000700

0 x 01

WORLD
8-1

TIME
242

0 0



NINTENDO



3RD
1:24:00



TIME
0:13:15

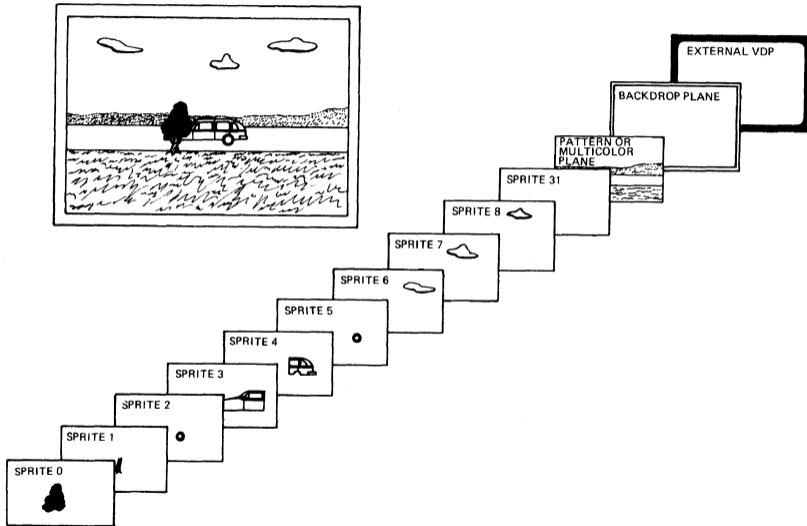
TUNNELS



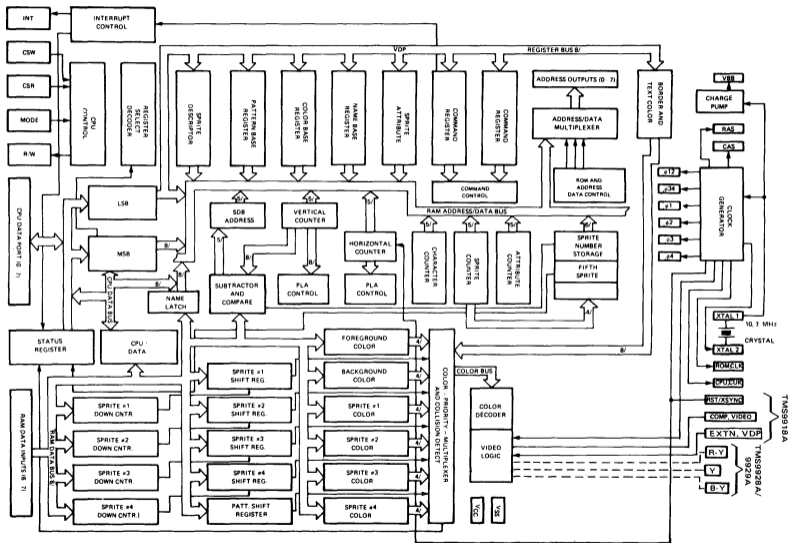
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TEXAS INSTRUMENTS

TMS9918 Video Display Processor



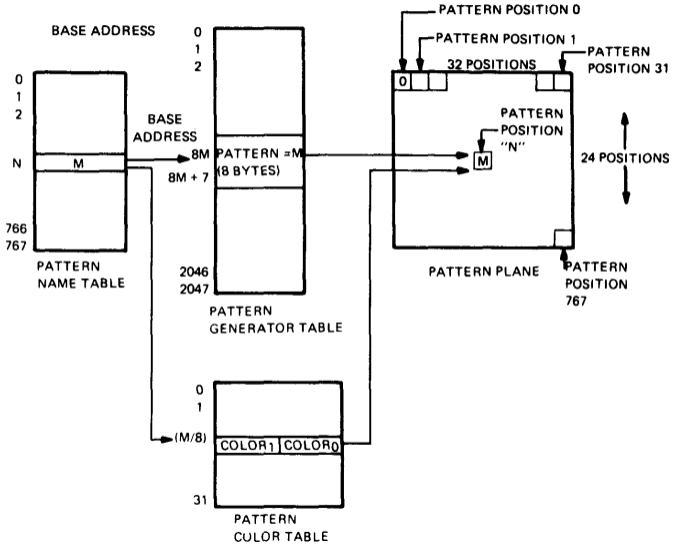
TMS9918 Video Display Processor



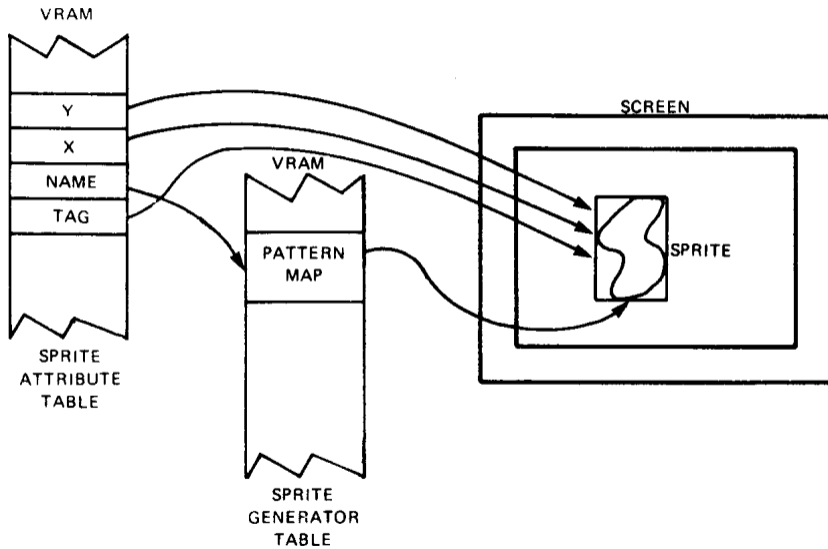
TMS9918A

TMS9928A/
SP29A

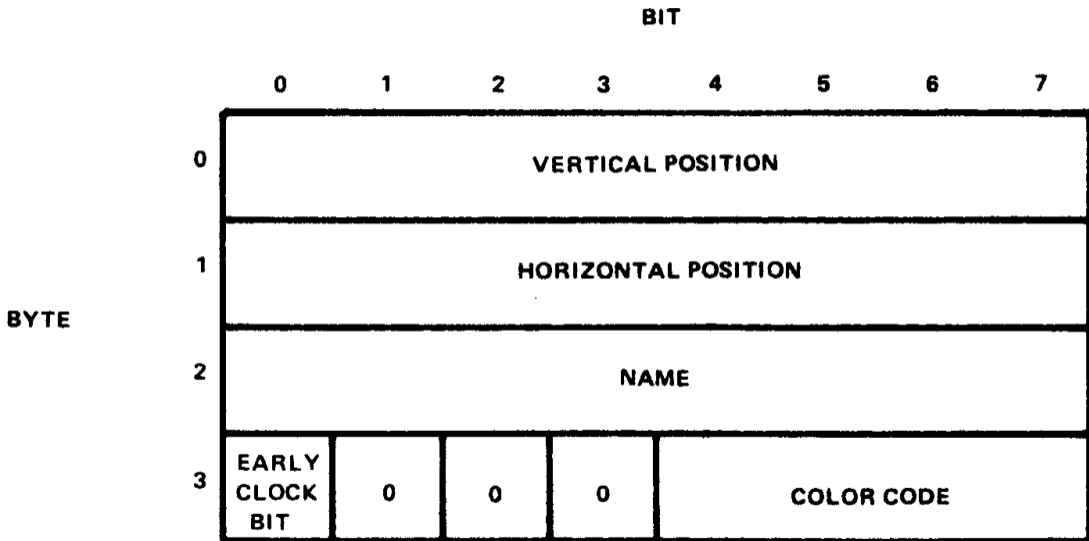
TMS9918 Pattern Generation



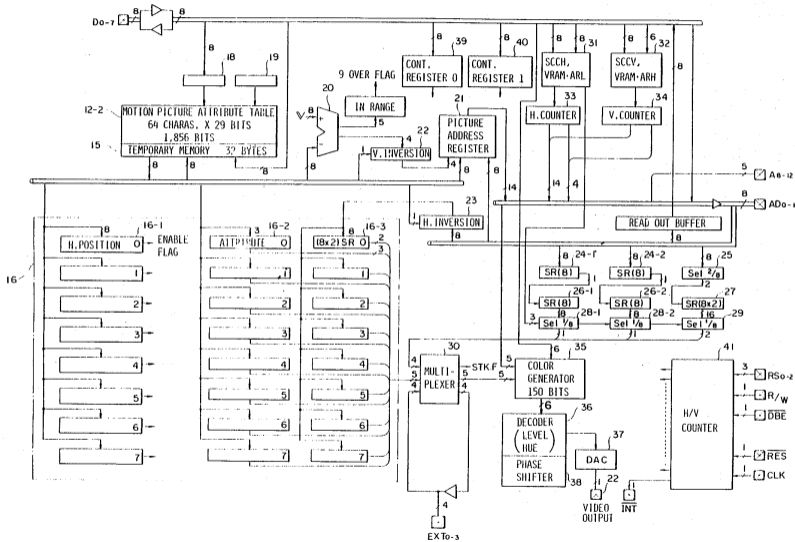
TMS9918 Sprite Generation



TMS9918 Sprite Attribute Table Entry



Nintendo NES/Famicom



Basic Operation

For each line,

- ▶ Fetch color palette
- ▶ Fetch tiles
- ▶ Fetch tile bitmaps
- ▶ Read sprite location data for 64 sprites
- ▶ Save and prioritize up to 8 visible sprites

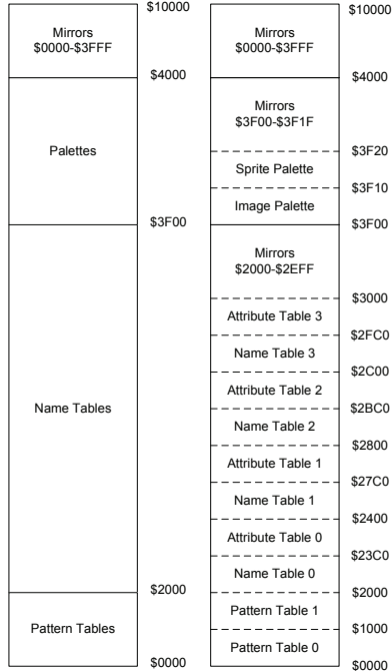
Video RAM Memory Map

Palettes: Groups of 16 colors selected from ≈ 60

Name Table: Tile numbers

Attribute Table: Extra tile color information

Pattern Table: Tile bitmaps



A Sprite Attribute Table Entry

64 sprites max; 8 per line max

7								0							
Y coordinate															
Tile (bitmap) number															
Vertical Flip		Horizontal Flip		Priority		0	0	0	b3		b2		color bits		
X coordinate															

Tiles are 2×8 bytes each. First 8 are bitmaps of LSB color value, next 8 are next color bit.

References

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NES Palette Generator http://nesdev.parodius.com/kevin_palette.txt

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Ueda et al. TV Game System Having Reduced Memory Needs. United States Patent #4,824,106.
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