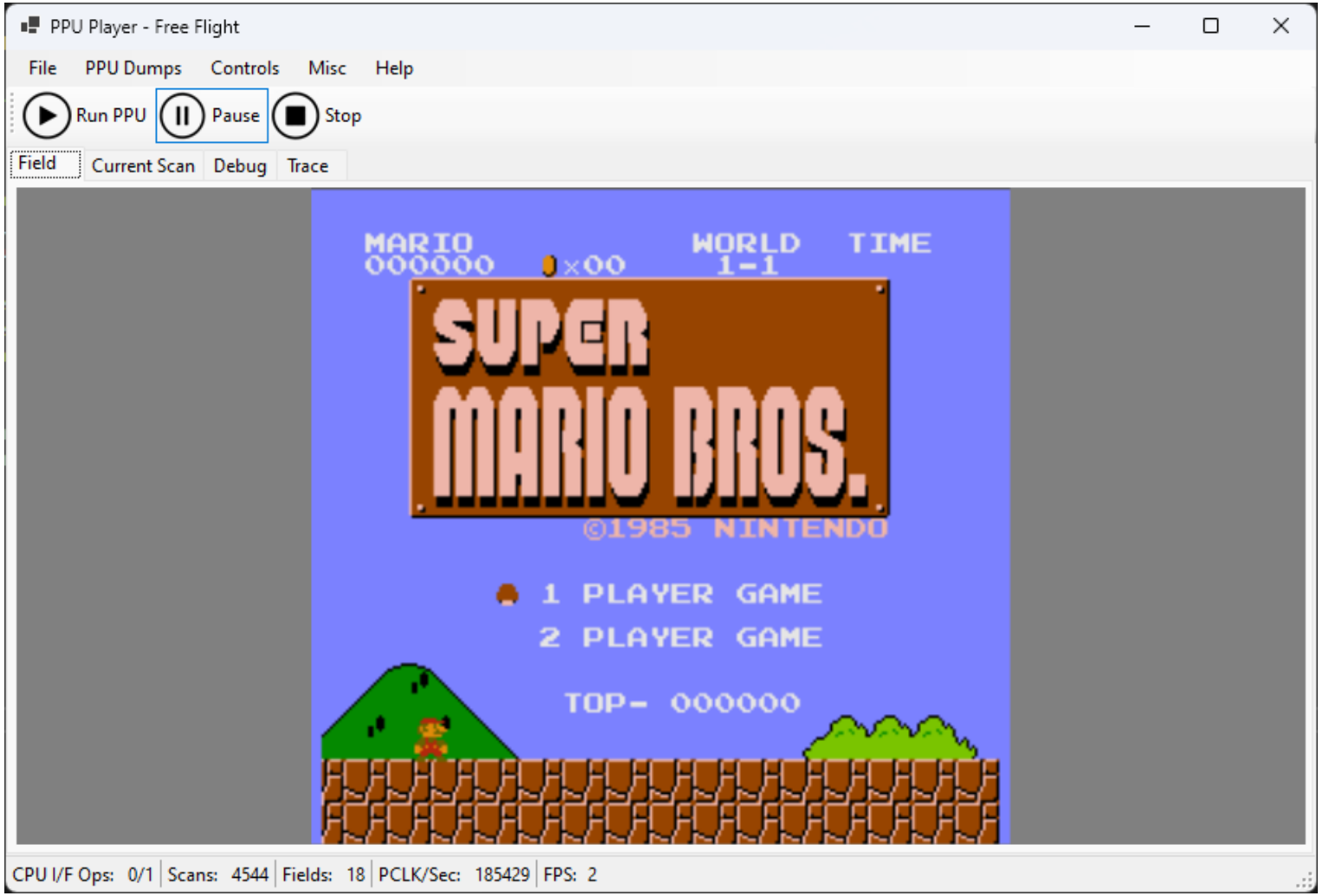
PPU Player

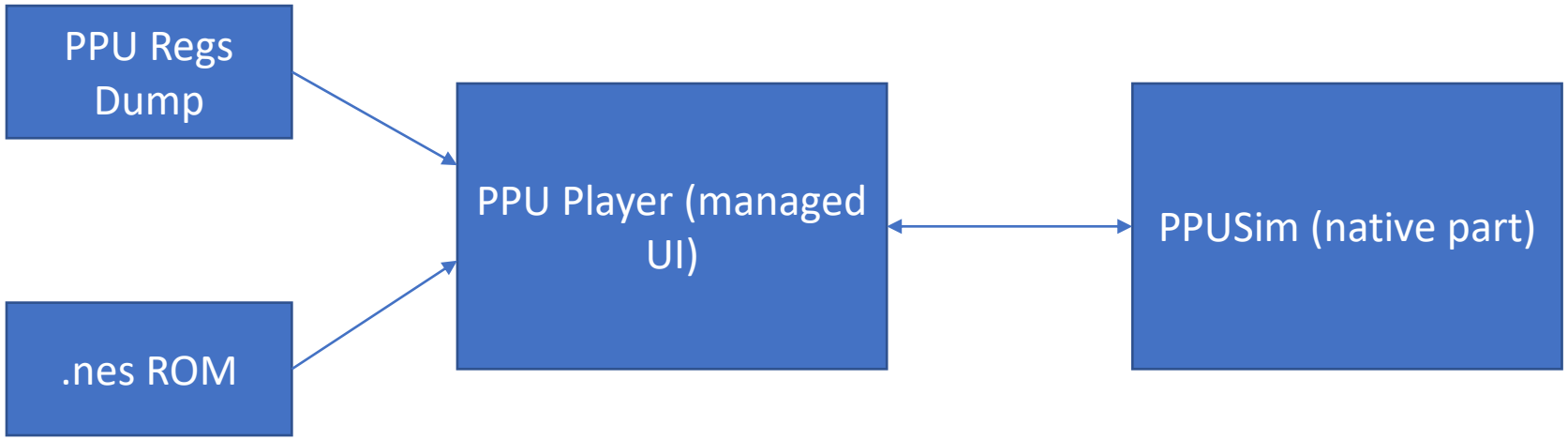
breaknes/BreaksPPU/PPUPlayer at main · emu-russia/breaknes (github.com)

What is it

Essentially a PPU emulator



Architecture



A little more to make it clearer

A special version of the Nintendulator, which collects writes to the PPU registers in a dump (.bin file)

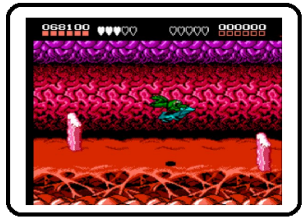
dump of writes into registers

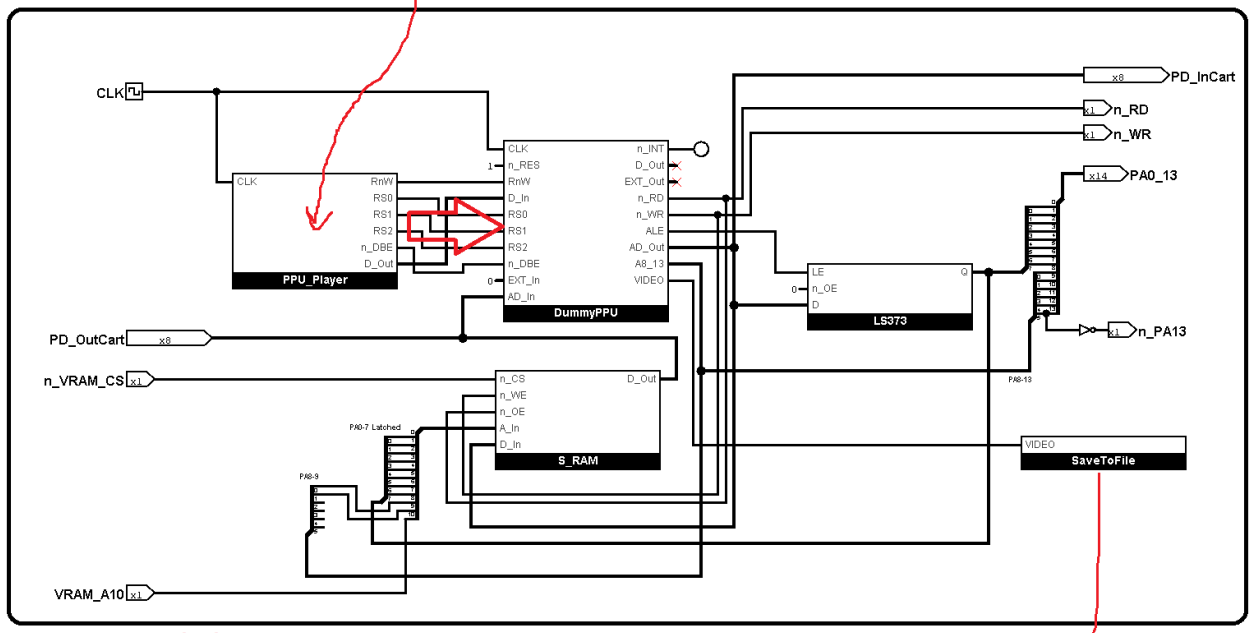
ppu_dump.bin

PPUPlayer looks at the PCLK and writes to the PPU register when the moment comes

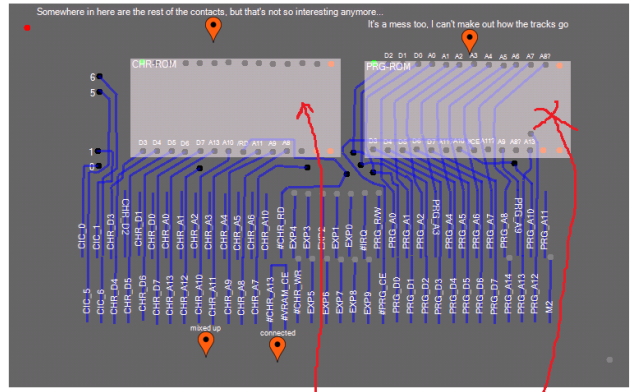
C# app

Image screen;





It sits in a .DLL



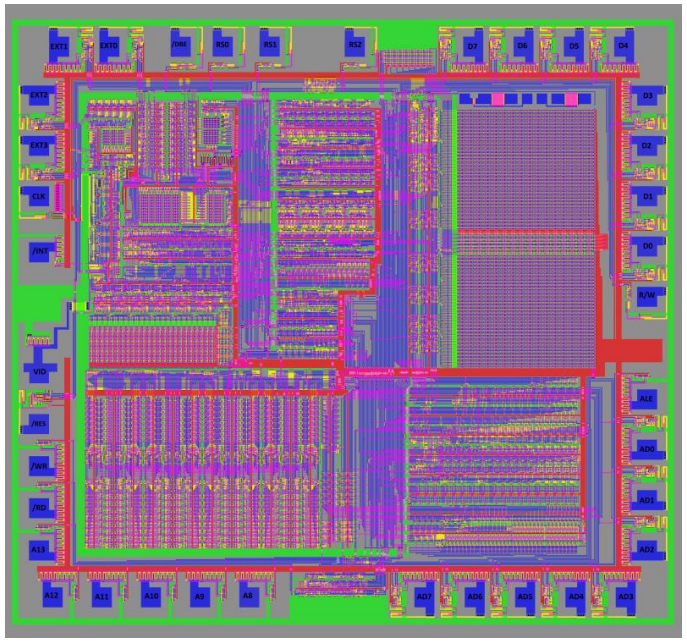
not required

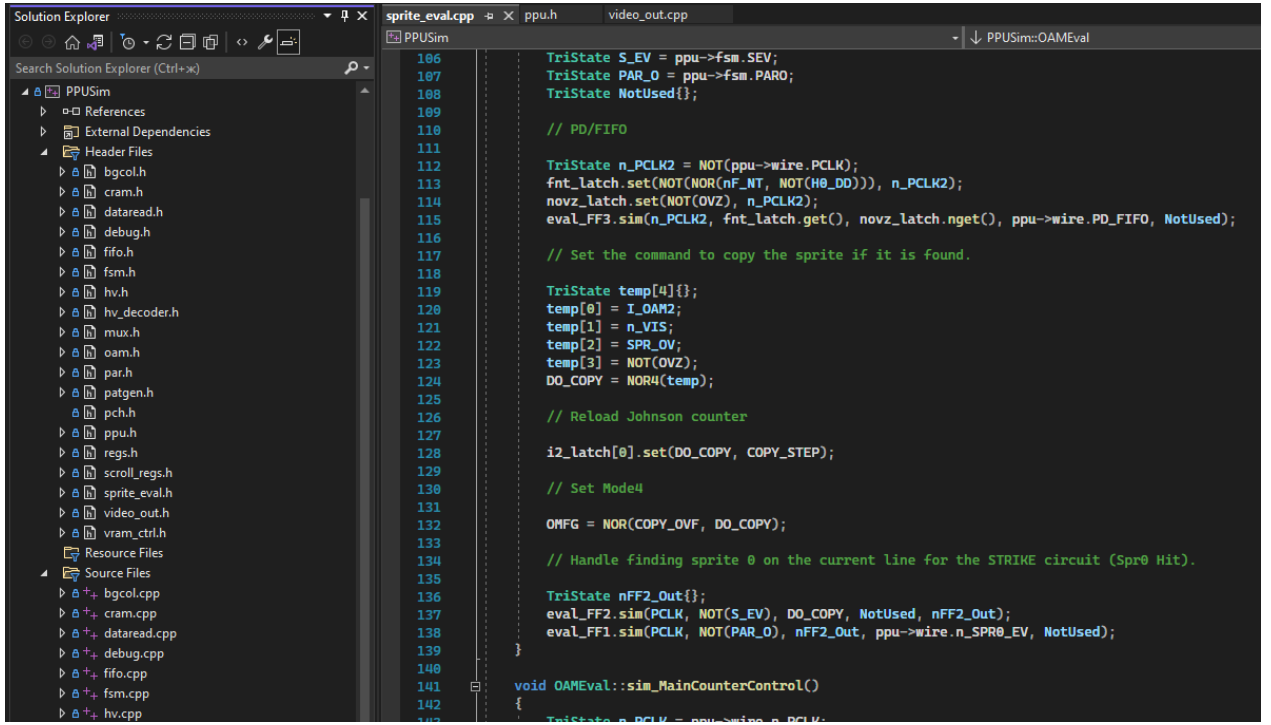
bomberman.nes
(or any other on Mapper 0)

Samples are sampled.
As it is sampled for 1 frame, it is output as Image.

PPUSim

- A full-fledged C++ PPU simulator at the logic gate level





.nes ROM image

- Simple dumps are supported, based on mapper 0 (NROM)
- Bomberman, Super Mario etc.

RegDump

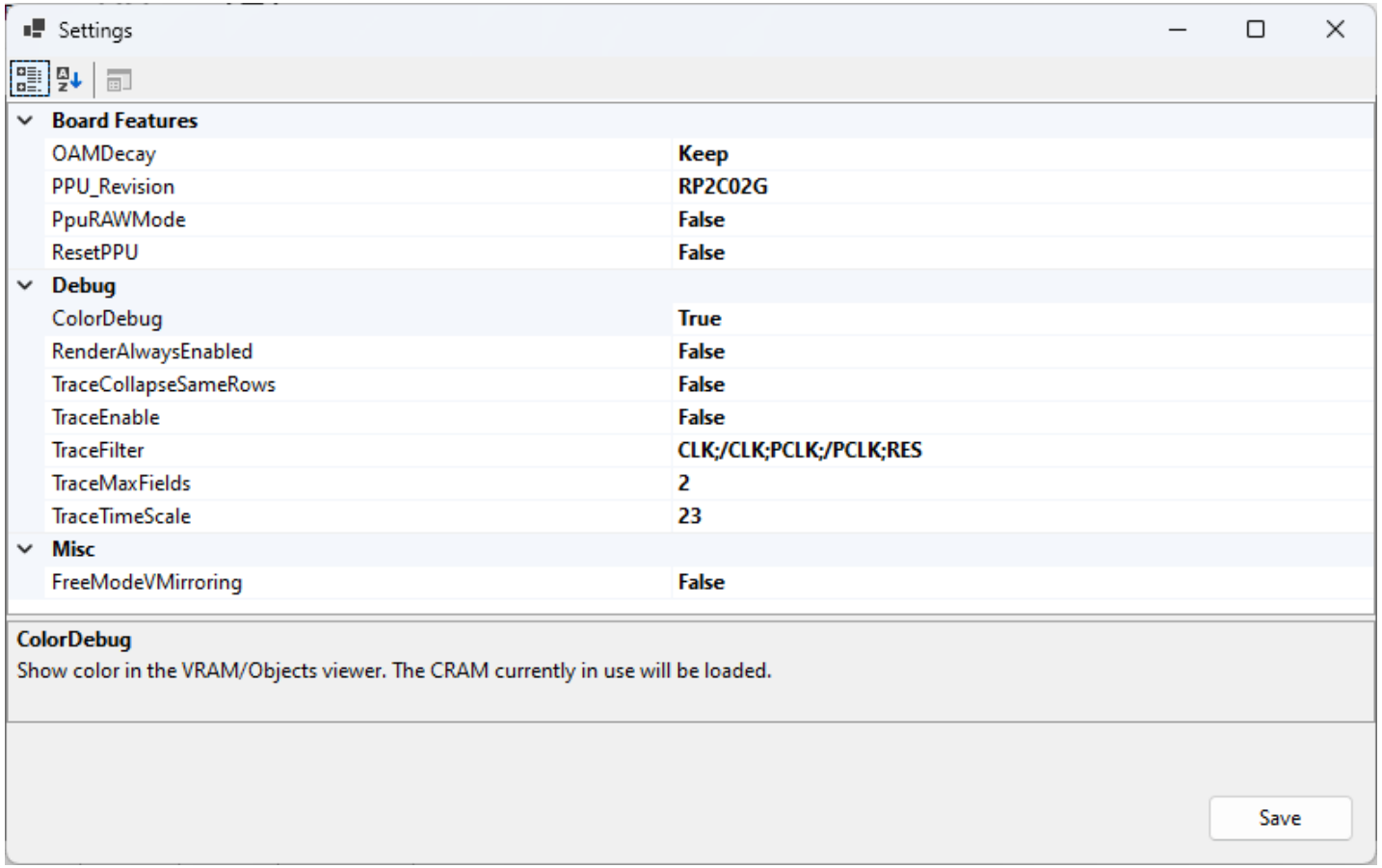
- Dump of access to PPU registers on the CPU side
- Array of records in simple format

```
#pragma pack(push, 1)
struct PPULogEntry
{
	uint32_t	pclkDelta;	// Delta of previous PCLK counter value at the time of accessing to the register
	uint8_t		reg;		// PPU register index (0-7) + Flag (msb - 0: write, 1: read)
	uint8_t		value;		// Written value. Not used for reading.
	uint16_t	padding;	// Not used (yet?)
};
#pragma pack(pop)
```

Free Flight Mode

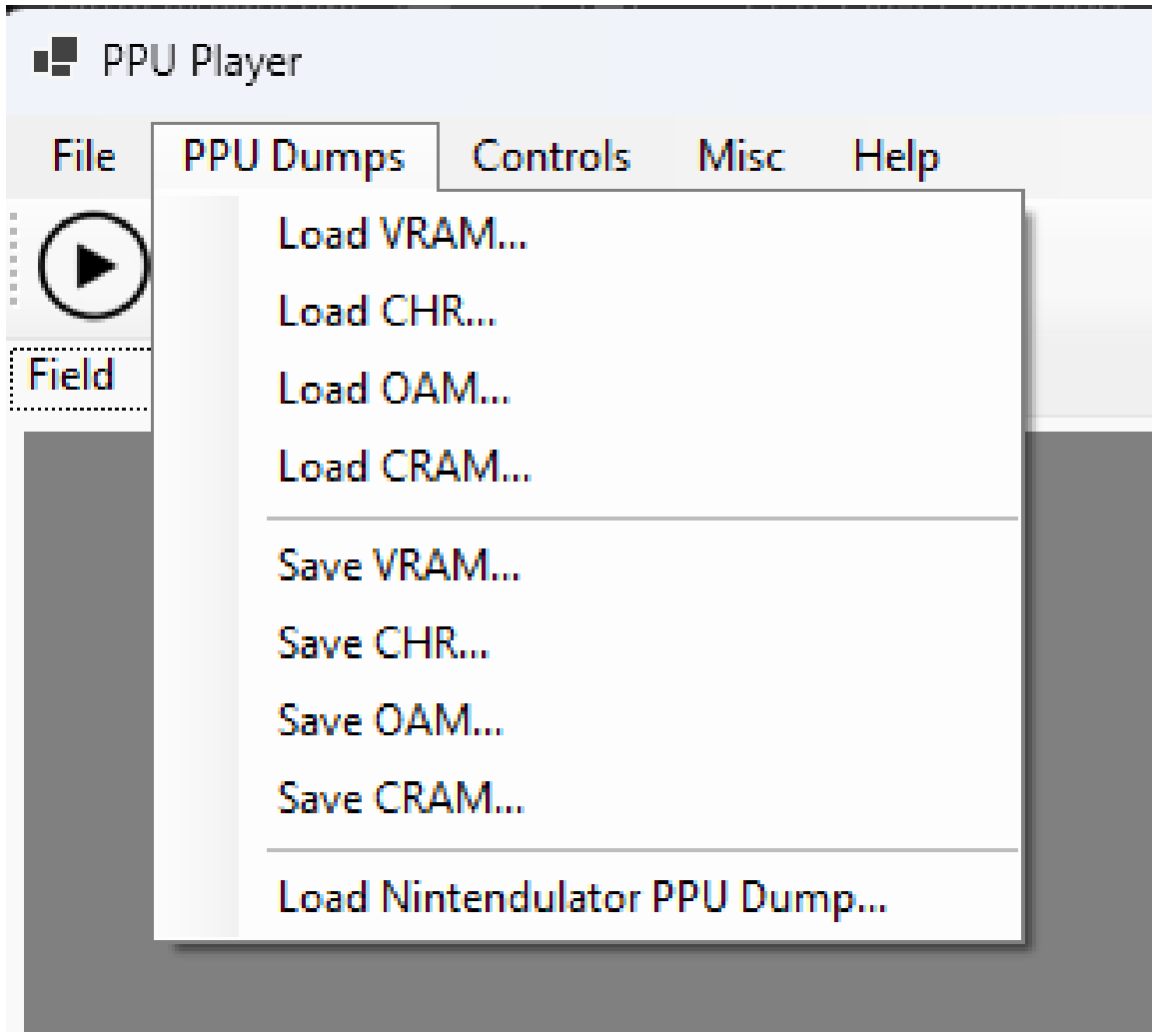
- Press «Run PPU» and go
- PPU register dump or NES ROM are not required
- PPU outputs what is loaded in VRAM / CHR / OAM

Settings


Settings
Board Features
OAMDecay
Keep
PPU_Revision
RP2C02G
PpuRAWMode
False
ResetPPU
False
Debug
ColorDebug
True
RenderAlwaysEnabled
False
TraceCollapseSameRows
False
TraceEnable
False
TraceFilter
CLK;/CLK;PCLK;/PCLK;RES
TraceMaxFields
2
TraceTimeScale
23
Misc
FreeModeVMirroring
False
ColorDebug
Show color in the VRAM/Objects viewer. The CRAM currently in use will be loaded.
Save

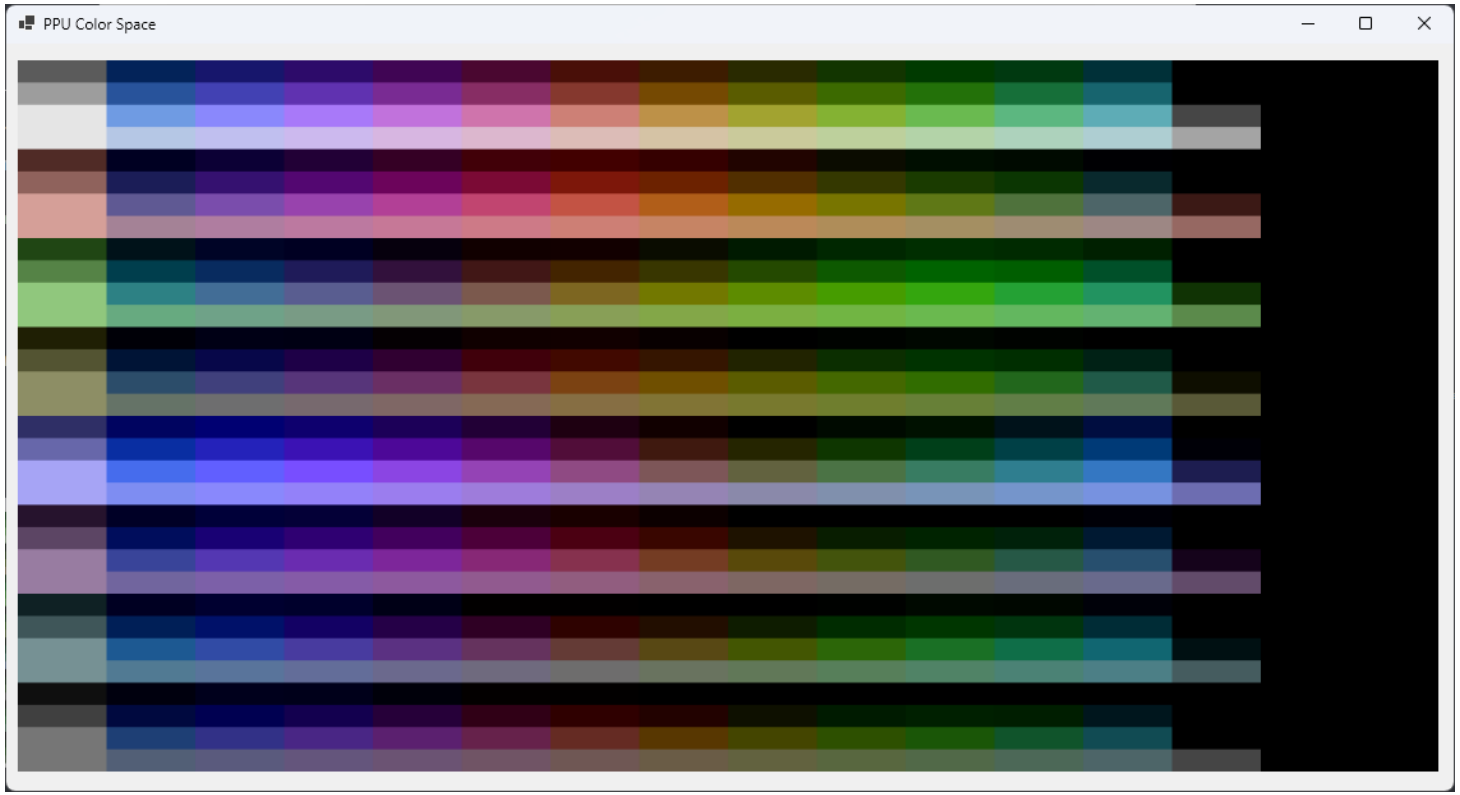
Working with PPU memory dumps

- VRAM / CHR / OAM / CRAM can be loaded and saved
- You can load a PPU memory dump from the Nintendulator

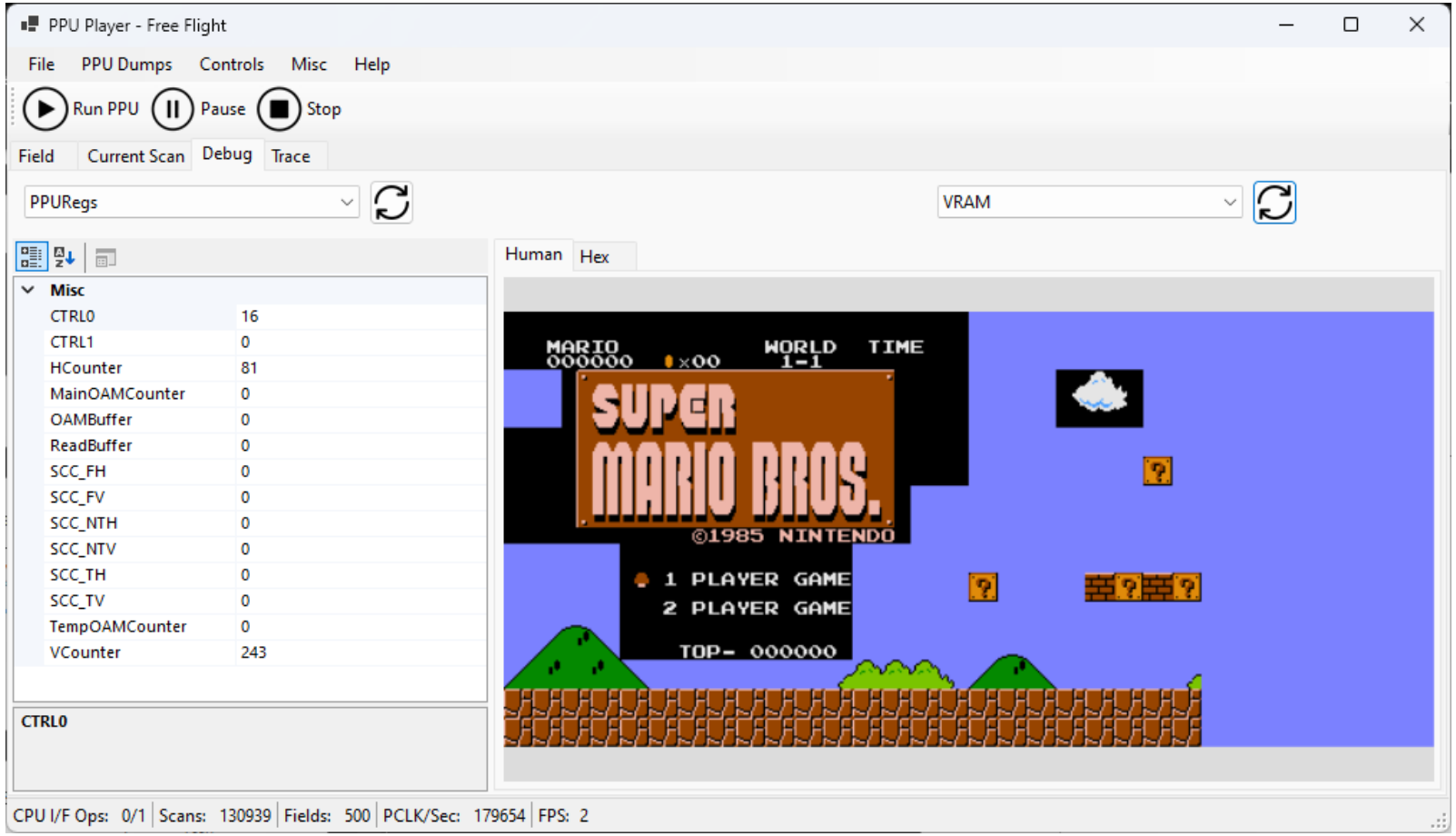


PPU Color Space

- Shows the color space ("palette") of the PPU
- Including Emphasis



Debugging


PPU Player - Free Flight
File
PPU Dumps
Controls
Misc
Help
Run PPU
Pause
Stop
Field
Current Scan
Debug
Trace
PPURegs
VRAM
Human
Hex
Misc
CTRL0 16
CTRL1 0
HCounter 81
MainOAMCounter 0
OAMBuffer 0
ReadBuffer 0
SCC_FH 0
SCC_FV 0
SCC_NTH 0
SCC_NTV 0
SCC_TH 0
SCC_TV 0
TempOAMCounter 0
VCounter 243
CTRL0
MARIO 000000
×00
WORLD 1-1
TIME
SUPER MARIO BROS.
©1985 NINTENDO
1 PLAYER GAME
2 PLAYER GAME
TOP- 000000
CPU I/F Ops: 0/1
Scans: 130939
Fields: 500
PCLK/Sec: 179654
FPS: 2

Debugging capabilities

- Watch the state of PPU signals
- Watch the state of the PPU registers
- Change the value of PPU registers $2000/$2001 on the fly
- Watch VRAM / CHR / OAM / Temp OAM / CRAM memory in Hex
- Watching memory in a "human" representation

Questions?

- Ask @org / Discord