

godanng

enl5

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 @drhelius

Emulator = legal

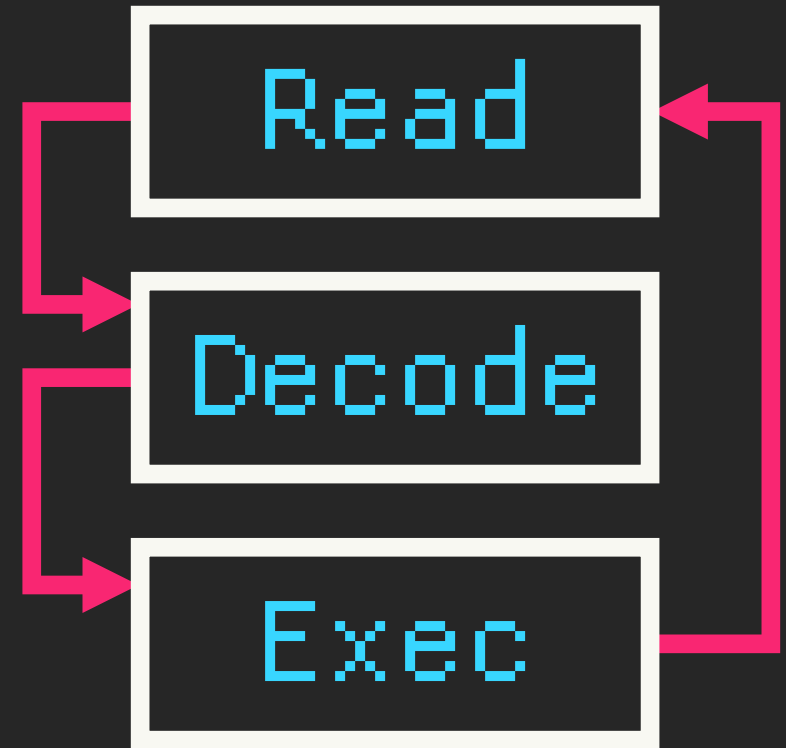
ROM = illegal

Emulator \neq Simulator

Interpreter

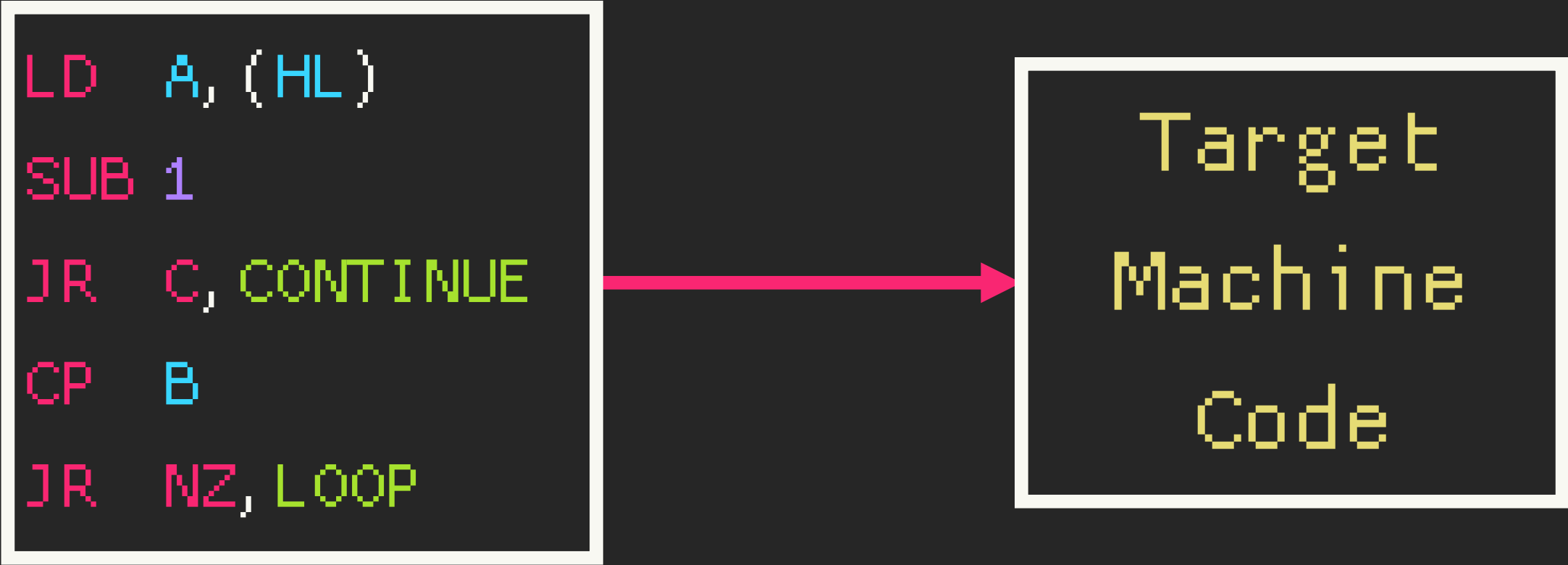


```
LD  A, (HL)
SUB 1
JR  C, CONTINUE
CP  B
JR  NZ, LOOP
```



Binary Translation

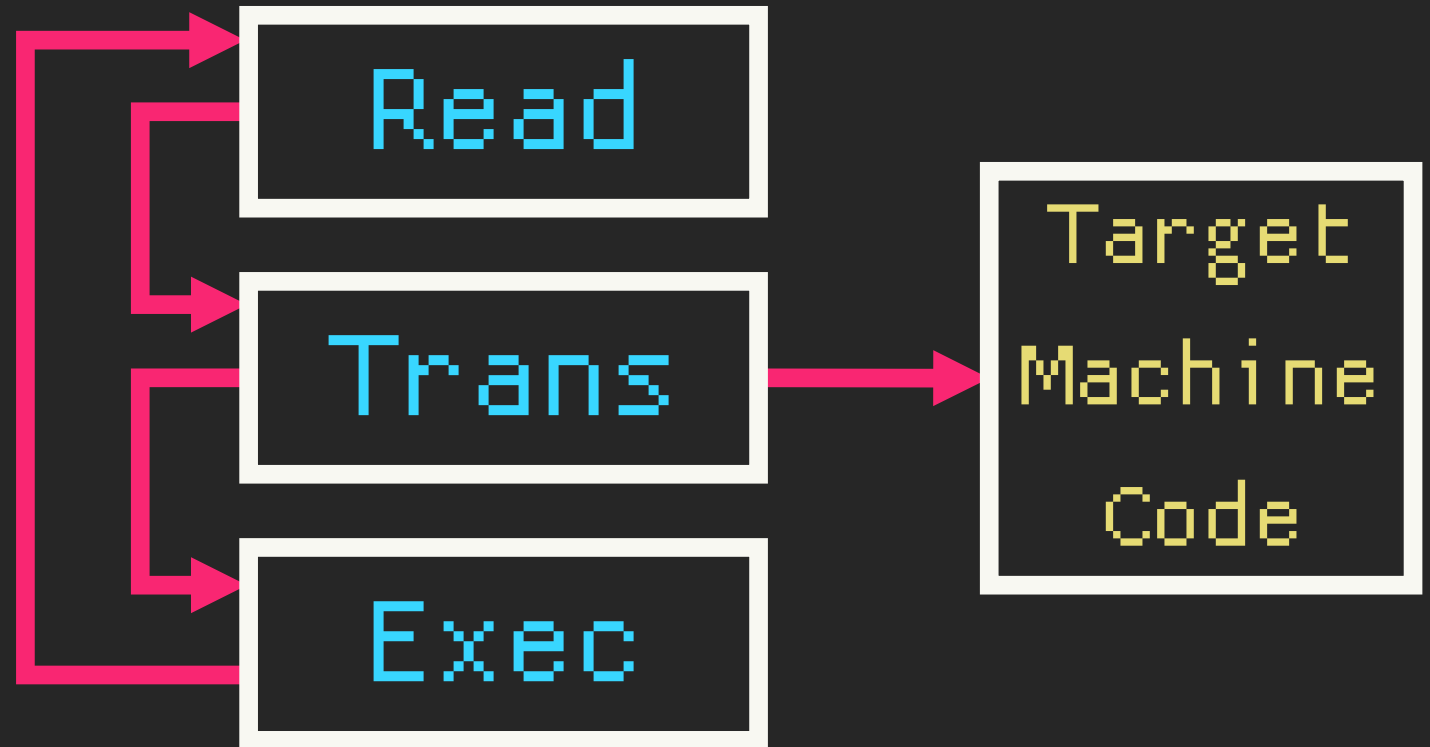
```
LD  A, (HL)
SUB 1
JR  C, CONTINUE
CP  B
JR  NZ, LOOP
```

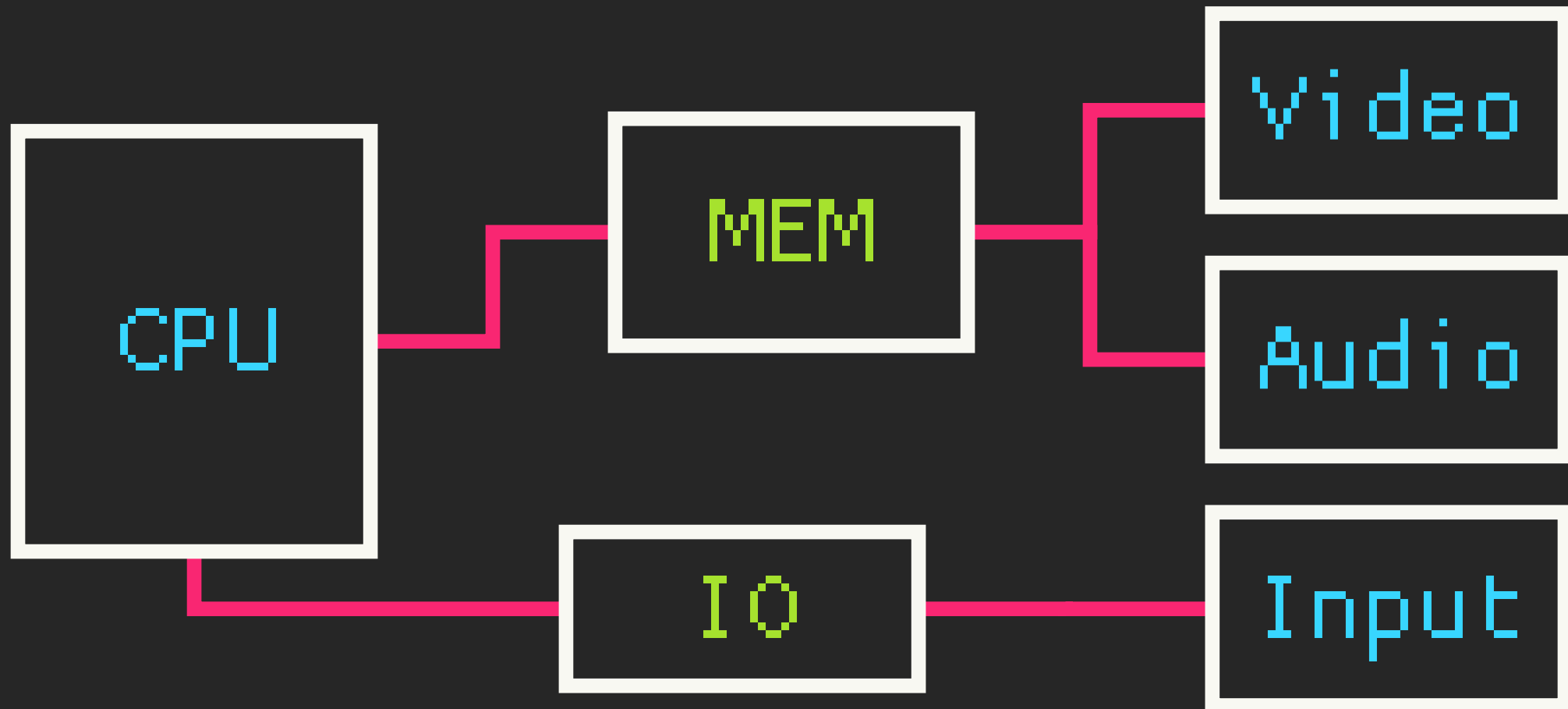


Target
Machine
Code

Dynamic Recompilation

```
LD    A, (HL)
SUB   1
JR    C, CONTINUE
CP    B
JR    NZ, LOOP
```





CPU

6502

NES

Atari 2600

Commodore 64

Apple 2

Super NES 65816

Z80

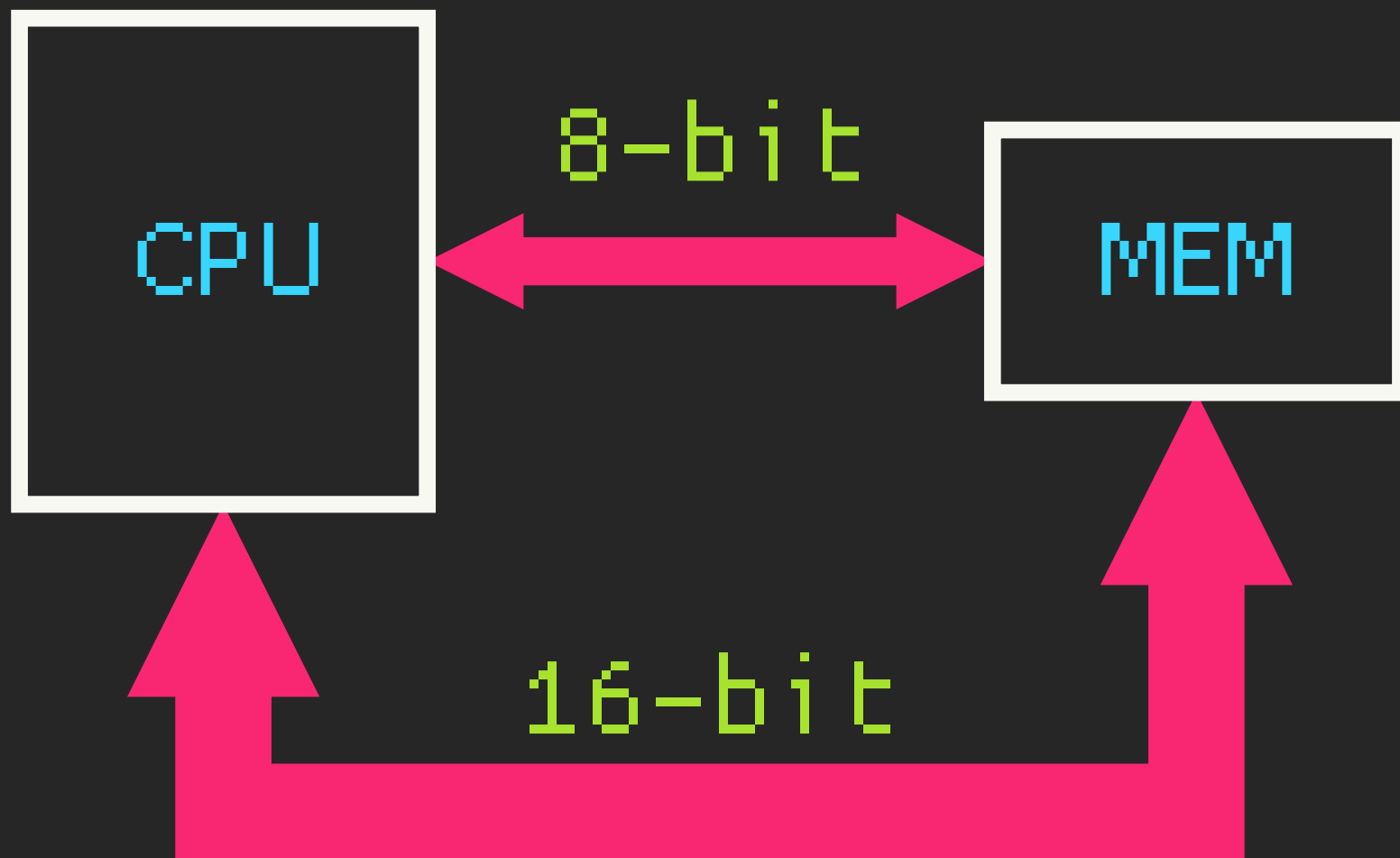
Game Boy *

Master System

Game Gear

MSX

ZX Spectrum



0

0000

16KB

16KB

16KB

16KB

65535

FFFF

opcode

opcode

opcode

8DC4F3CD — parameter

parameter — 293D2144

FF3E92BE

20FDCD0C

.....

Main Loop

```
while true {  
    updateCPU()  
    updateVideo()  
    updateInput()  
    updateAudio()  
}
```

```
updateCPU() {  
    opcode = fetchOpcode()  
    runOpcode(opcode)  
}
```

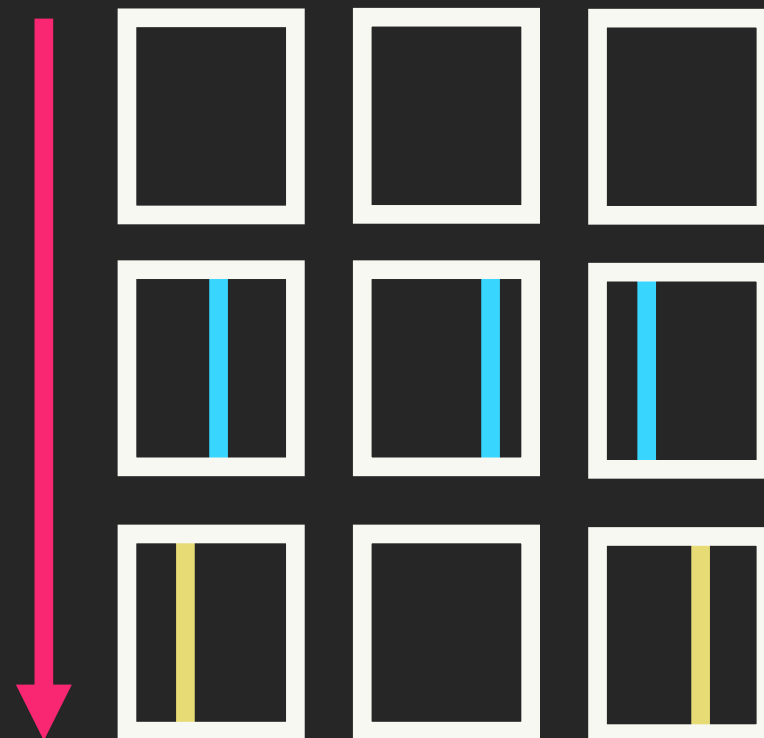


100 clks

CPU

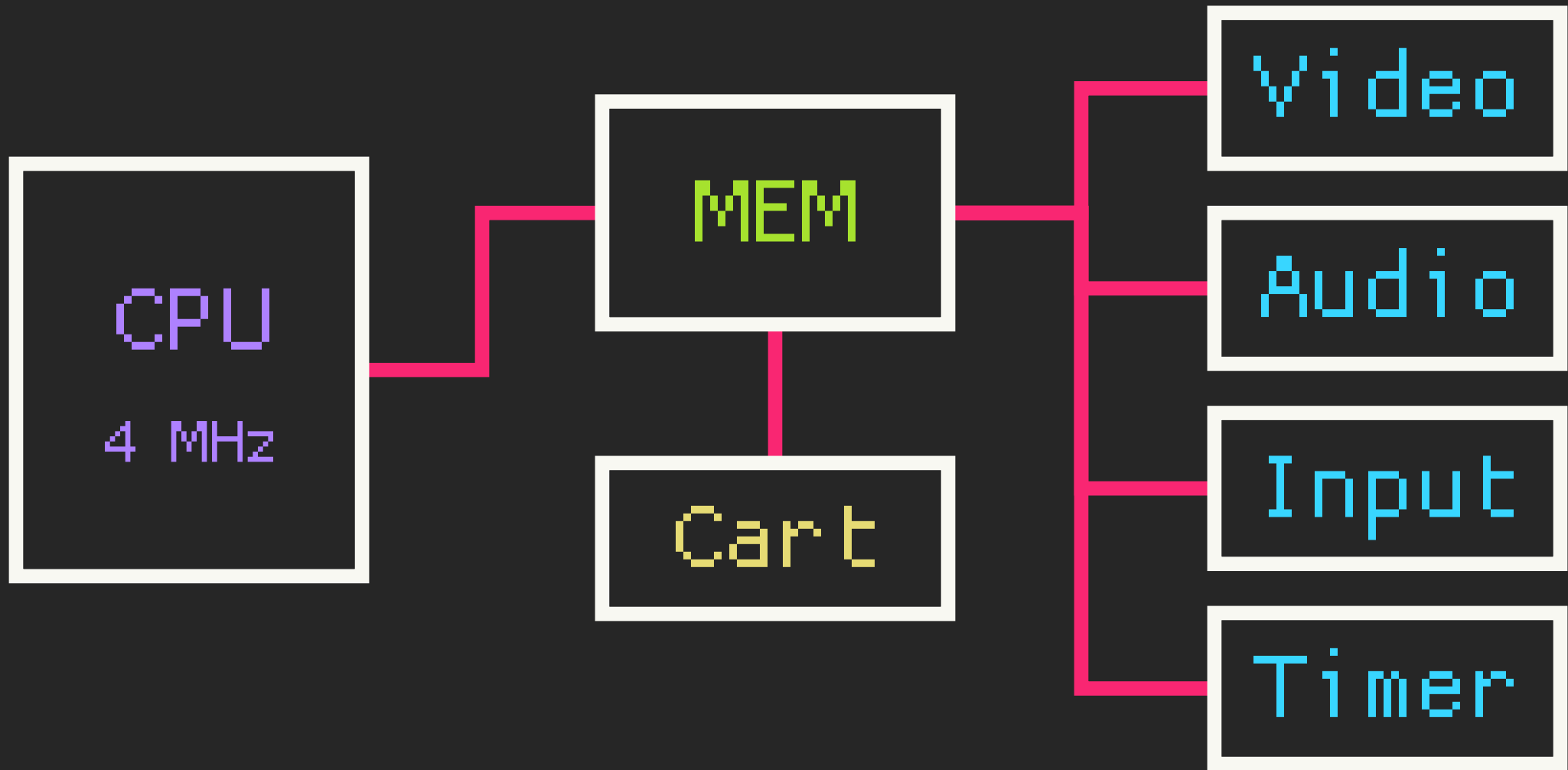
Video

Input

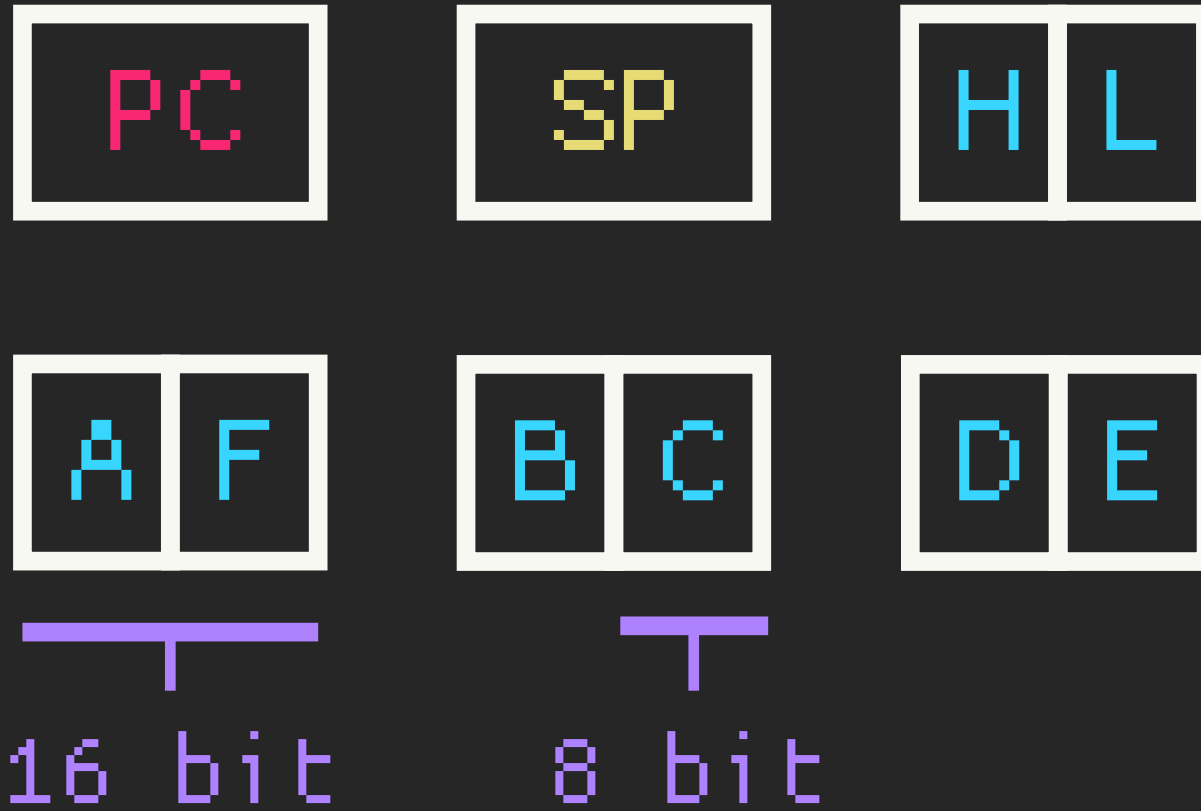


N clks

Game Boy



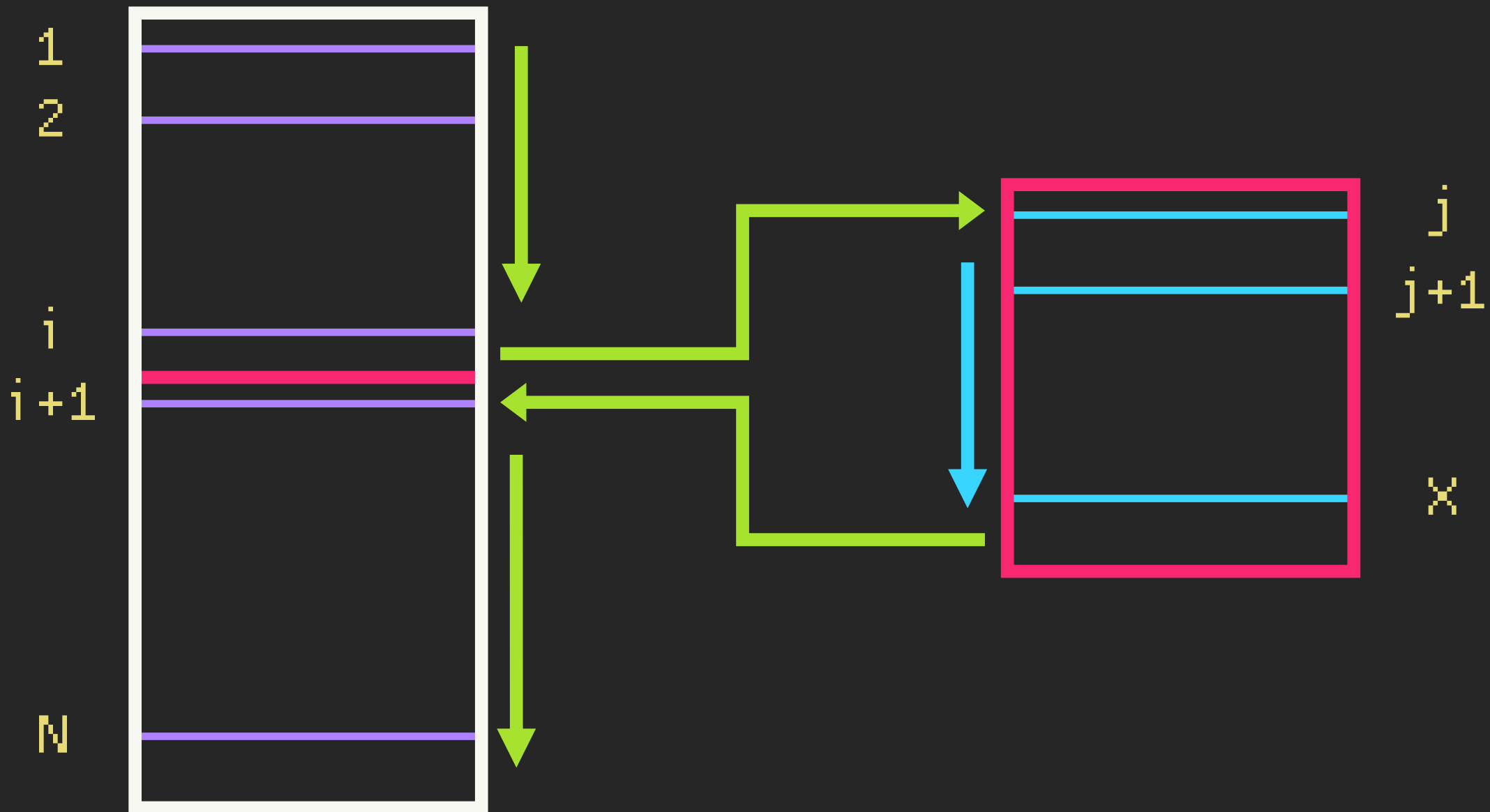
CPU



Flags

Z	N	H	C	0	0	0	0
7	6	5	4	3	2	1	0

0000	16 KB ROM Bank 0	— cartridge
4000	16 KB switchable ROM bank	
8000	8 KB Video RAM	
A000	8 KB switchable RAM bank	— cartridge
C000	8 KB internal RAM	
E000	Mirror 8 KB internal RAM	
FE00	Sprite Memory (OAM)	
FEA0	Empty	
FF00	IO Ports	
FF4C	Empty	
FF80	Internal RAM	
FFFF	Interrupt Register	



0000

16 KB ROM Bank 0

4000

16 KB switchable ROM bank

8000

00000

Bank 0

fixed

04000

Bank 1

switchable

08000

Bank 2

0C000

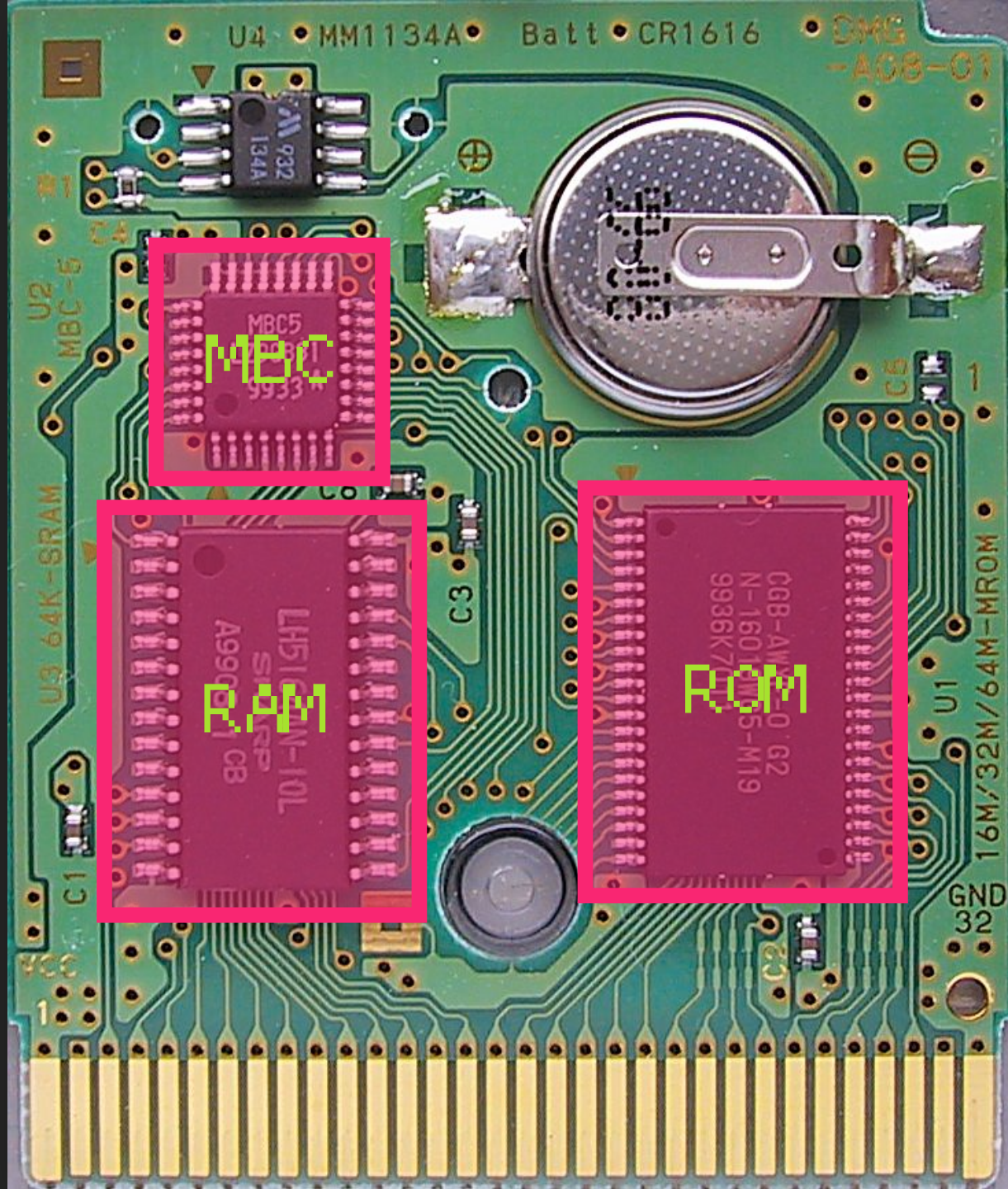
Bank 3

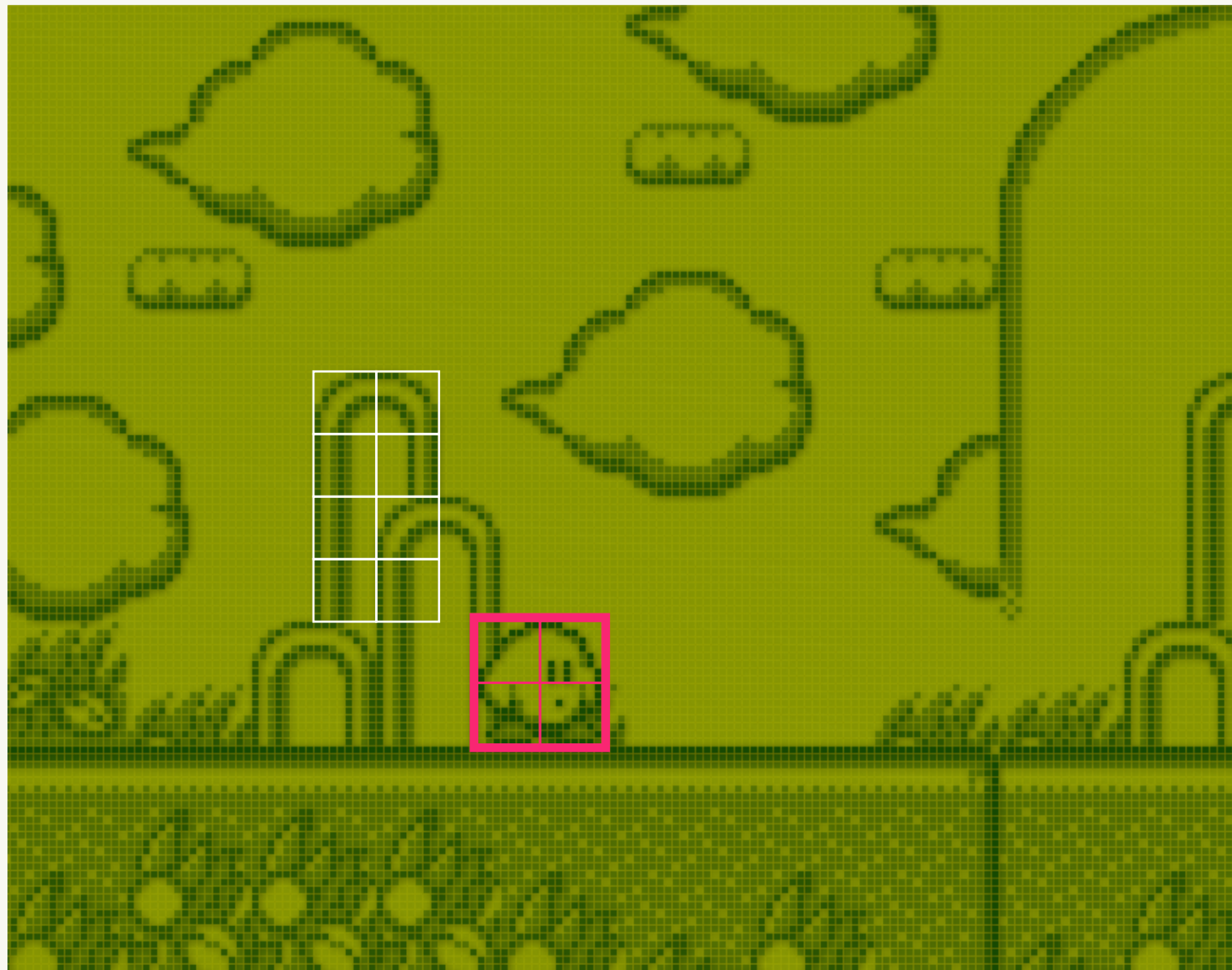
10000

Bank 4

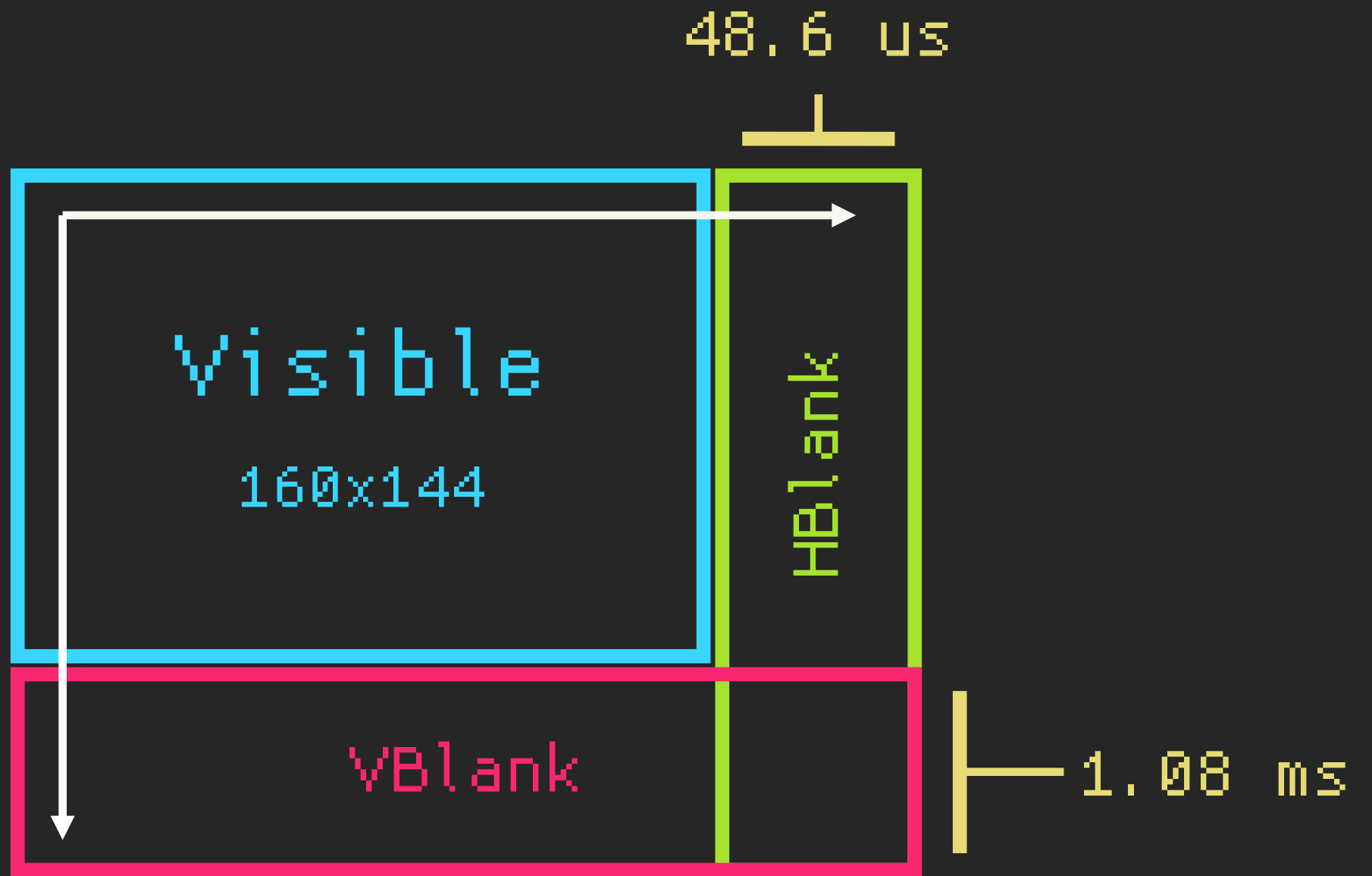
14000

...

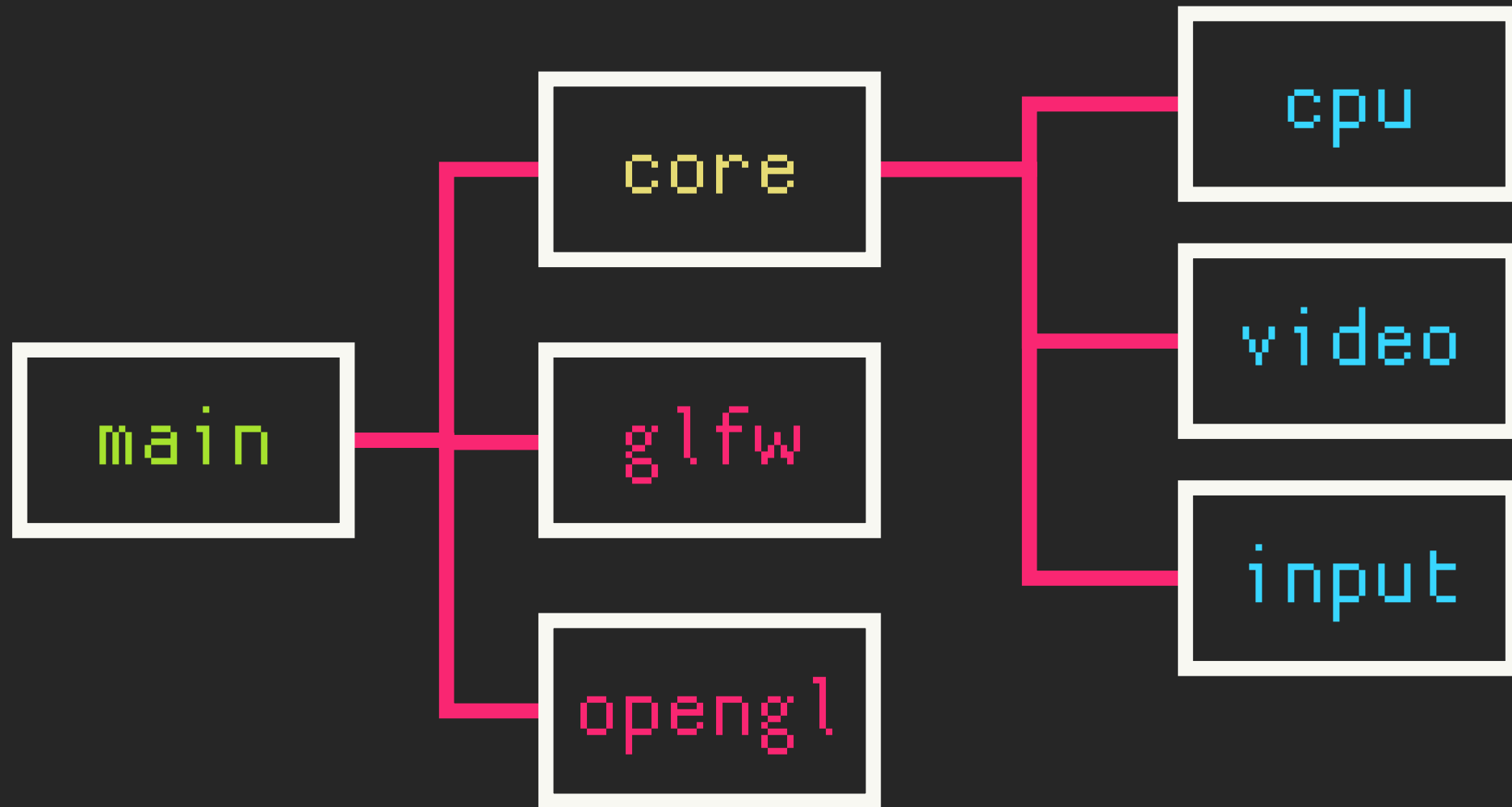




SC :	600	
KIRBY	000000	@x04



Demo Emulator



Workshop

```
go get -u github.com/drhelius/demo-emulator  
cd $GOPATH/src/github.com/drhelius  
go run main.go -rom workshop.rom
```