

KNOX

NES Photo Graphics

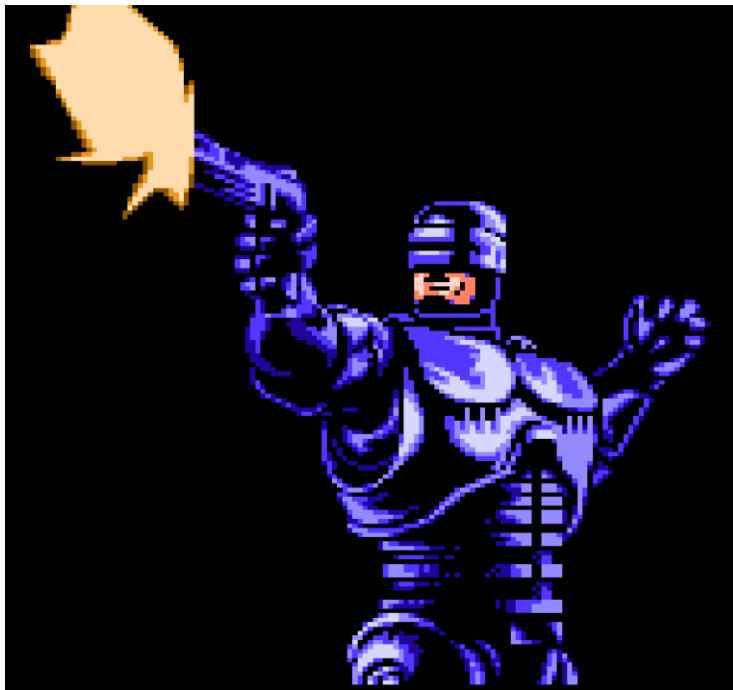
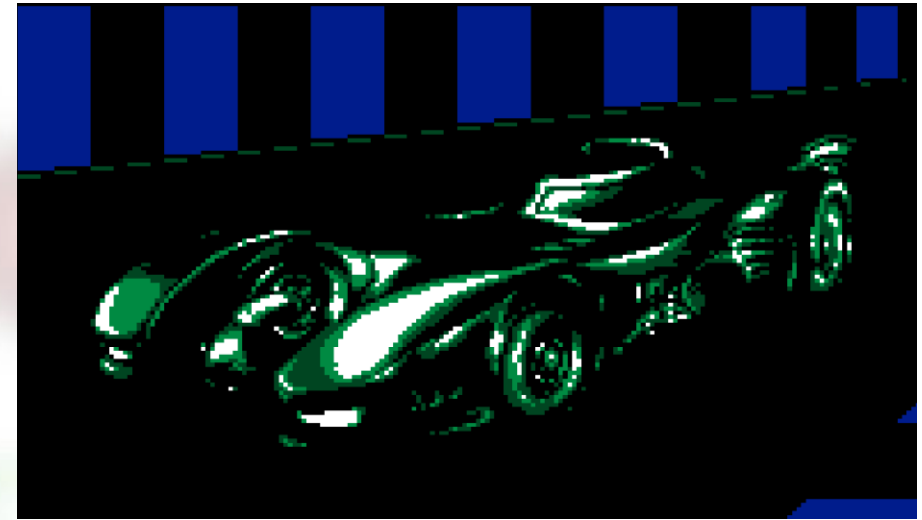
GAME

Knox Game Design

June 2026

DESIGN

Examples



Tools

- Gimp
 - converting photo palette
- NESASM
 - compiling 6502 assembly into NES ROM file
- YYCHR
 - converting image to NES format
- FCEUX
 - NES emulator

```
nesasm v3.6 - a 6502 assembler with specific NES support  
commit: 2b39ec6 @ https://github.com/ClusterM/nesasm/  
Usage: nesasm [OPTION...] <source.asm>
```



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NES assembly

- Background, Pattern Tables
 - tiles to display
- Palette
 - colors to use
- Attribute
 - where to apply each palette
- 6502 review
 - Nerdy Nights at NintendoAge (archived)

```
*** BACKGROUND
background:
.db $00,$00,$00,$00,$00,$00,$00,$00,$00,$00,$01,$02,$03,$04,$05,$06,$07
.db $08,$09,$0A,$0B,$0C,$0D,$0E,$0F,$00,$00,$00,$00,$00,$00,$00,$00

.db $00,$00,$00,$00,$00,$00,$00,$00,$10,$11,$12,$13,$14,$15,$16,$17
.db $18,$19,$1A,$1B,$1C,$1D,$1E,$1F,$00,$00,$00,$00,$00,$00,$00,$00

.db $00,$00,$00,$00,$00,$00,$00,$00,$20,$21,$22,$23,$24,$25,$26,$27
.db $28,$29,$2A,$2B,$2C,$2D,$2E,$2F,$00,$00,$00,$00,$00,$00,$00,$00

.db $00,$00,$00,$00,$00,$00,$00,$00,$30,$31,$32,$33,$34,$35,$36,$37
.db $38,$39,$3A,$3B,$3C,$3D,$3E,$3F,$00,$00,$00,$00,$00,$00,$00,$00

.db $00,$00,$00,$00,$00,$00,$00,$00,$40,$41,$42,$43,$44,$45,$46,$47
.db $48,$49,$4A,$4B,$4C,$4D,$4E,$4F,$00,$00,$00,$00,$00,$00,$00,$00

.db $00,$00,$00,$00,$00,$00,$00,$00,$50,$51,$52,$53,$54,$55,$56,$57
.db $58,$59,$5A,$5B,$5C,$5D,$5E,$5F,$00,$00,$00,$00,$00,$00,$00,$00

.db $00,$00,$00,$00,$00,$00,$00,$00,$60,$61,$62,$63,$64,$65,$66,$67
.db $68,$69,$6A,$6B,$6C,$6D,$6E,$6F,$00,$00,$00,$00,$00,$00,$00,$00

.db $00,$00,$00,$00,$00,$00,$00,$00,$70,$71,$72,$73,$74,$75,$76,$77
.db $78,$79,$7A,$7B,$7C,$7D,$7E,$7F,$00,$00,$00,$00,$00,$00,$00,$00
```

```
palette:
```

```
.db $0f,$35,$28,$07, $0f,$2c,$1a,$16, $0f,$0f,$0f,$0f, $0f,$0f,$0f,$0f
.db $0f,$0f,$0f,$0f, $0f,$0f,$0f,$0f, $0f,$0f,$0f,$0f, $0f,$0f,$0f,$0f
```

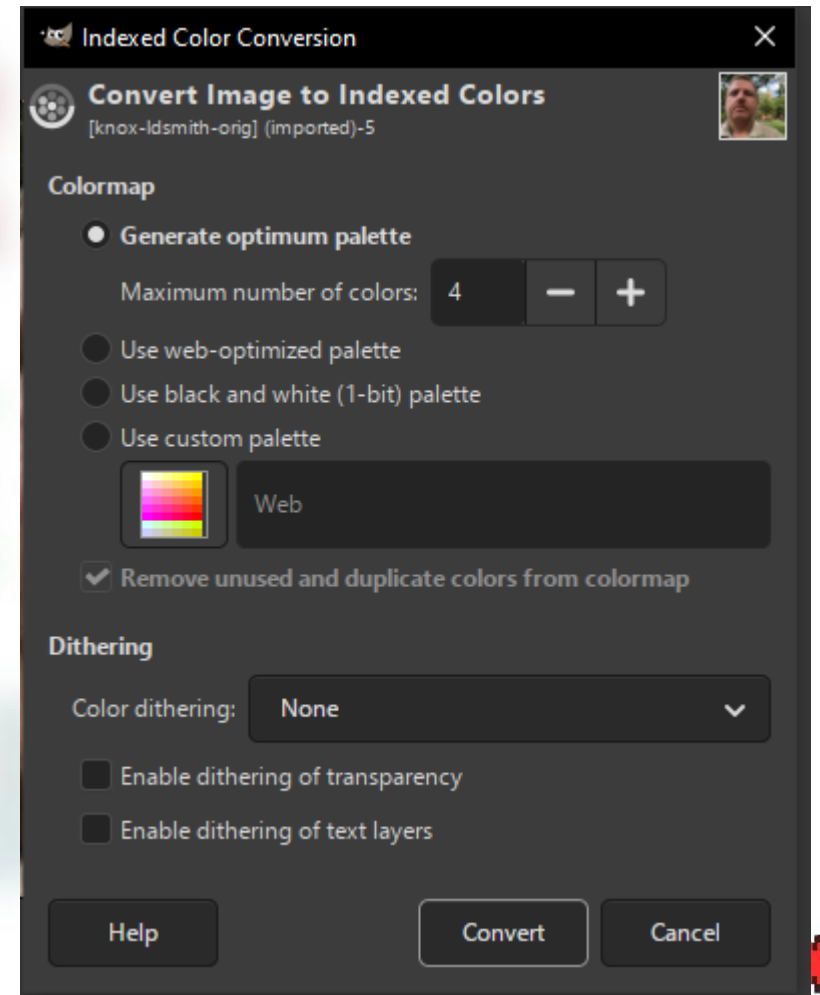
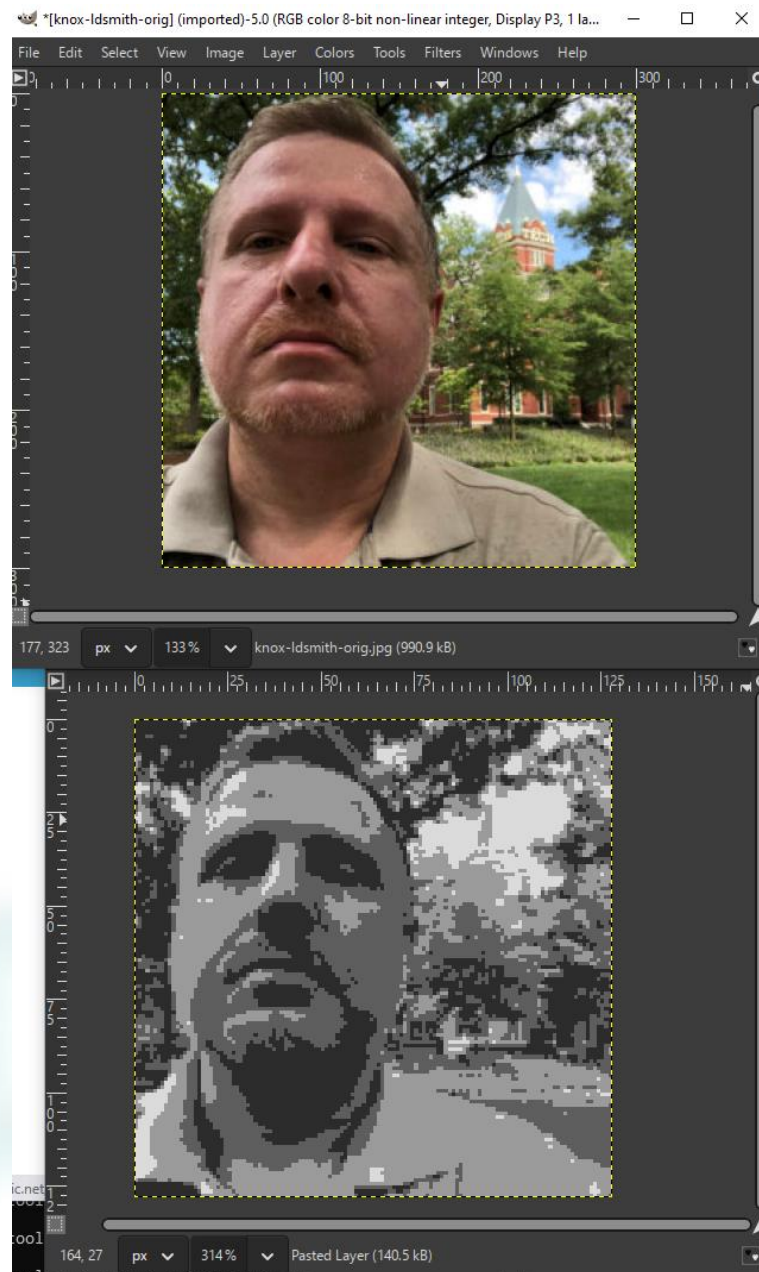
```
attribute:
```

```
.db %00000000, %00000000, %00000000, %00000000, %00000000, %00000000,
.db %00000000, %00000000, %00000000, %00000000, %01000000, %01010101,
```

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Gimp

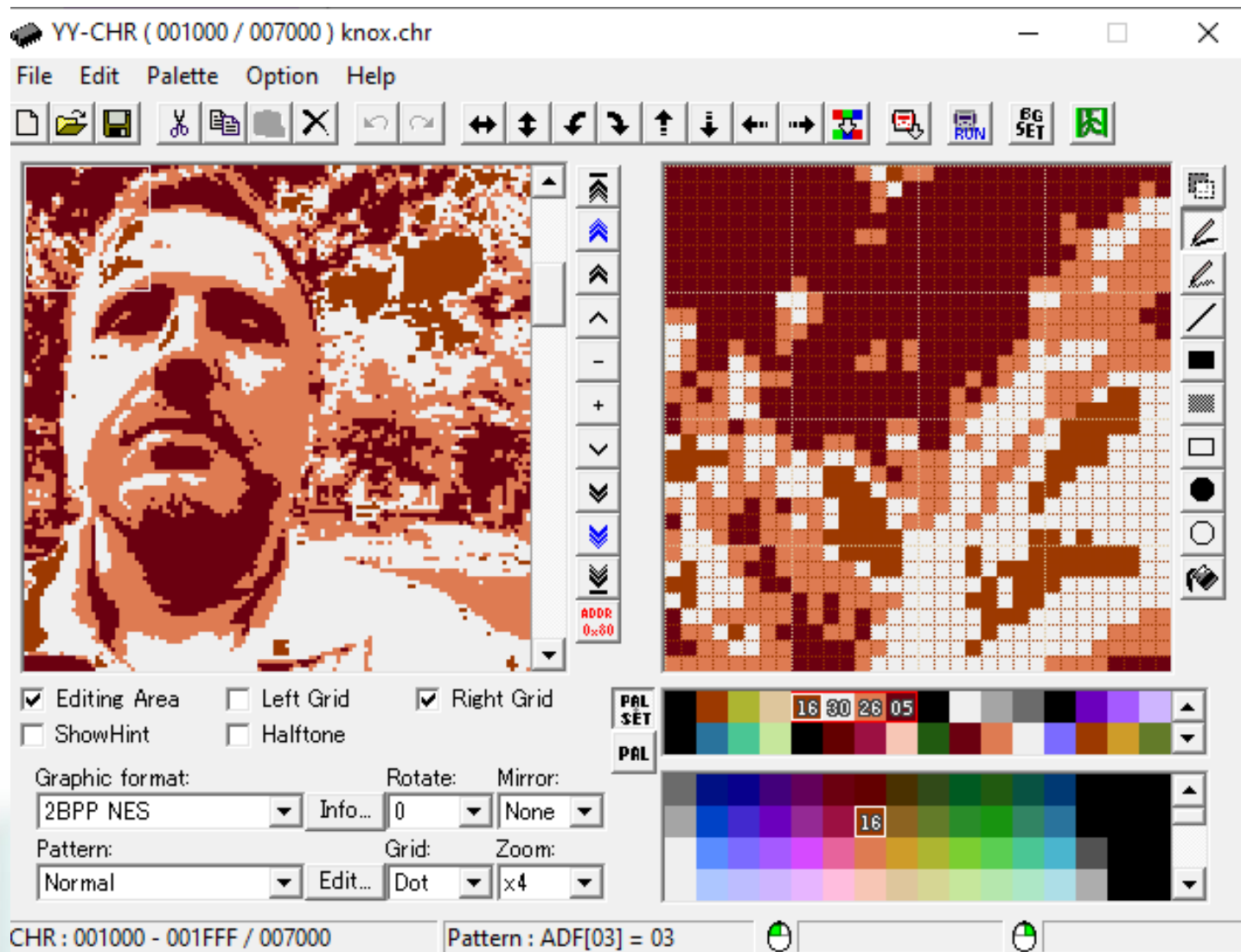
- Scale image size
 - this example uses 128x128 pixels
- Convert to grayscale (suggested)
- Gimp: Image > Mode > index (4 colors)
- Copy
- Paste into YY-CHR (max width is 128 pixels)
- Save to chr file
- Import into asm file



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YYCHR

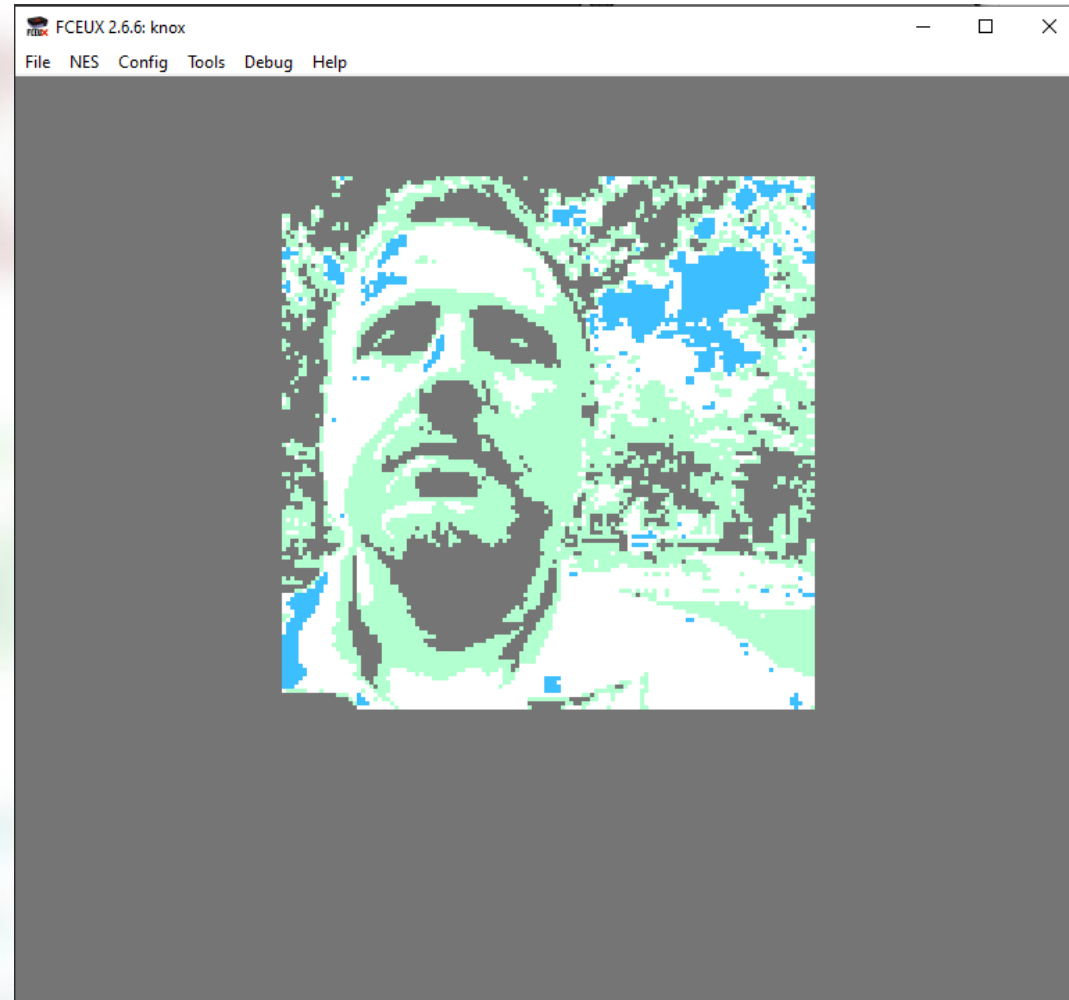
- Format
 - 2BPP NES
- Save to generate chr file
- Can change the palette colors, but the colors in YY-CHR are not retained on save / export
- Palette colors will be defined by the attributes in the assembly code file



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FCEUX

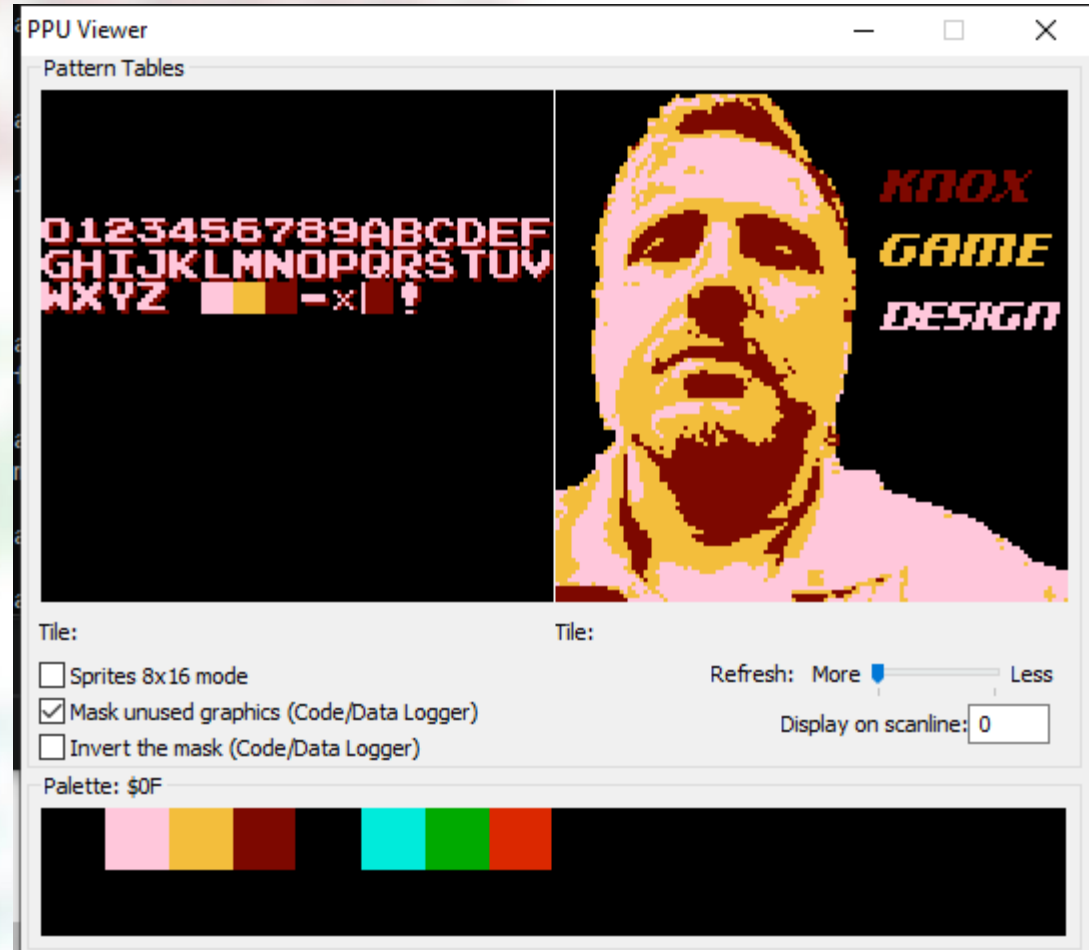
- Run NESASM assembler to include new chr file from YYCHR
- Run with FCEUX
- First step is to just get it to display in an NES game build



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Coloring the image

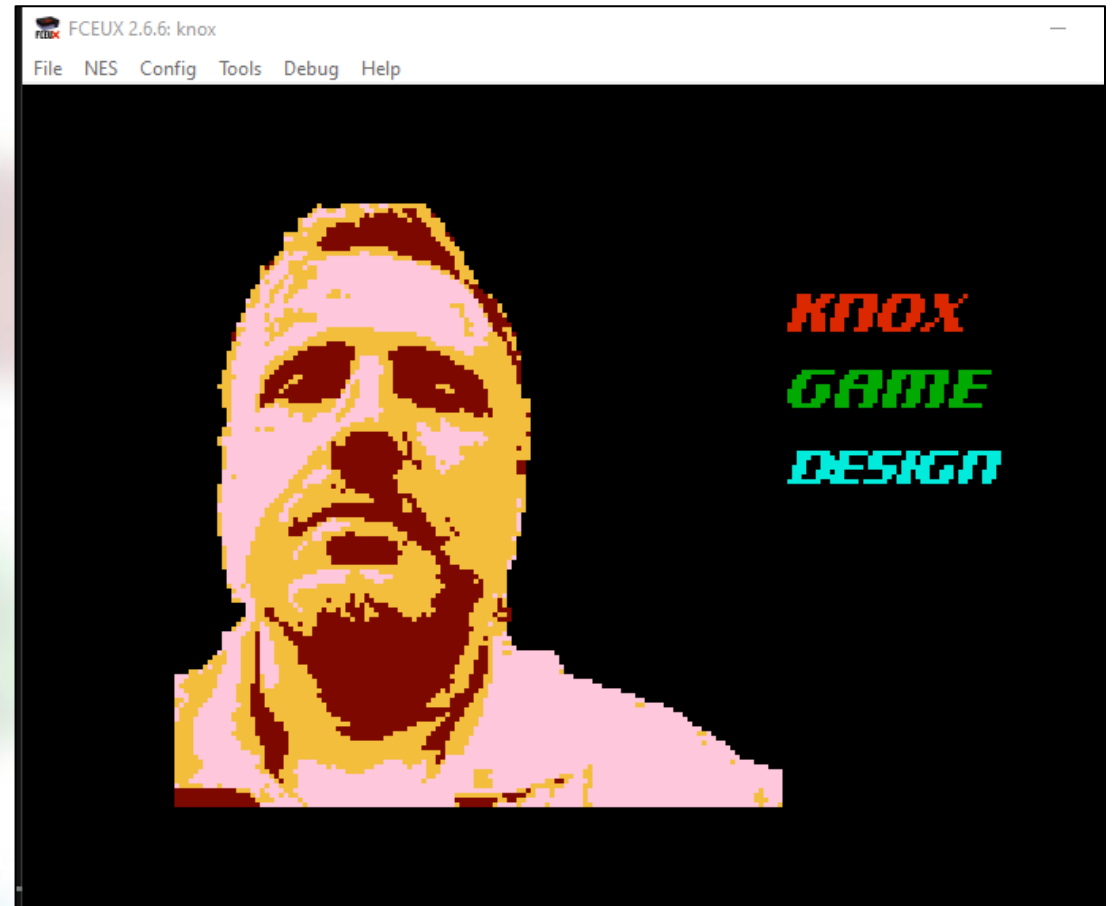
- Background palette
- Sprite palette
- Attributes
 - Each byte is a 16x16 area, divided into 4 squares (8x8 each)



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Other considerations

- Alter image in Gimp to better define areas to be colored by different attribute palettes
- Use Gimp grid feature (16 x 16 pixels) to lay out graphics
- Image cleanup
- Set transparent color to highlight
- Replace any unintentional transparent portions of the image
- Photo preparation (plain background, green screen, etc)
- Use checkerboard pattern to blend between two colors



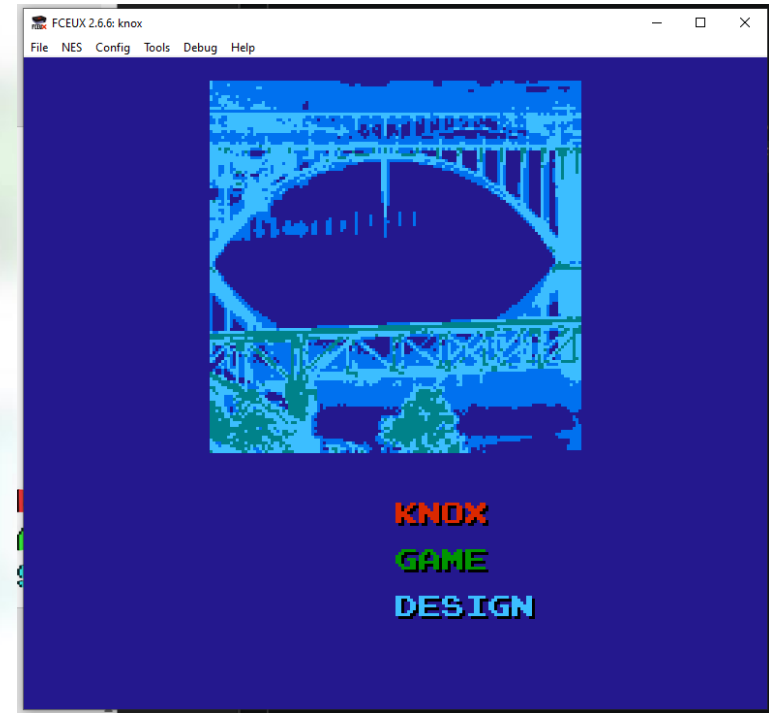
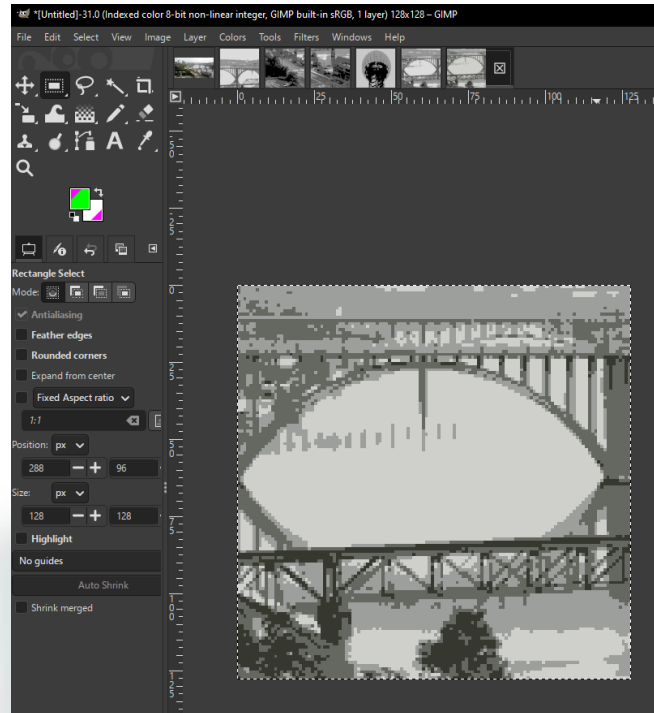
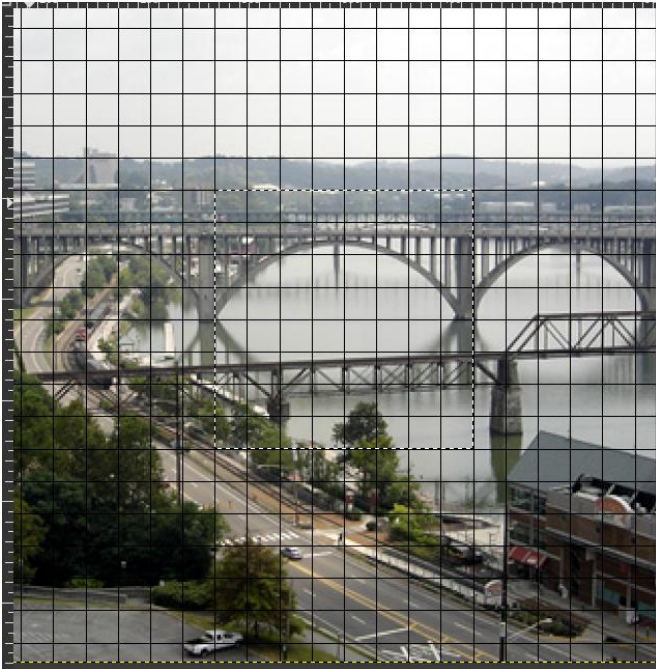
skin color 1 = \$35
skin color 2 = \$28
shadow = \$07

red text = \$16
green text = \$1A
cyan text = \$2C

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Limitations

- NES can only have two 16x16 tile pattern tables at a time (512 total tiles)
- Screen displays 960 tiles at 256x240 (NTSC) resolution
- Compress tiles, filter out blank tiles, remove duplicate tiles that can be mirrored, repeat background tiles



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Demos

- PowerPak (RetroUSB)
- EverDrive N8 PRO (KriKzz)
- Analogue Pocket (Analogue)



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