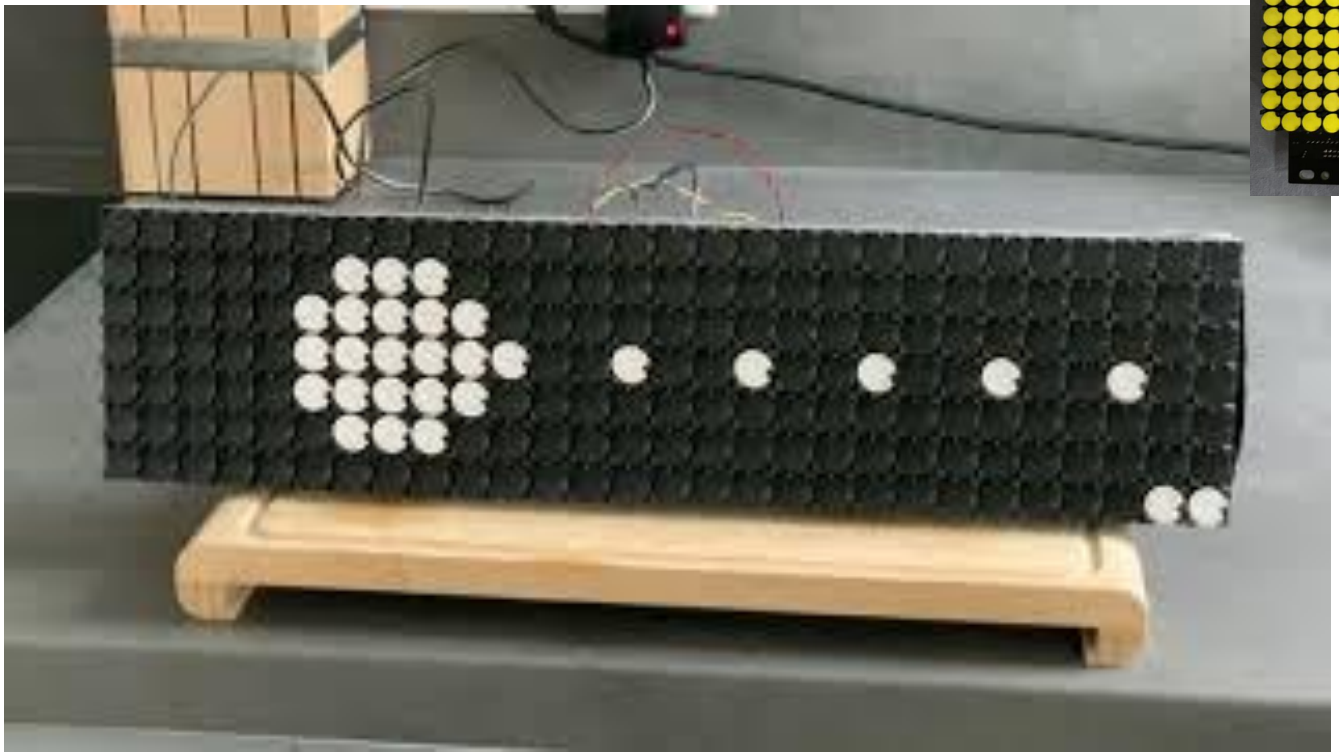
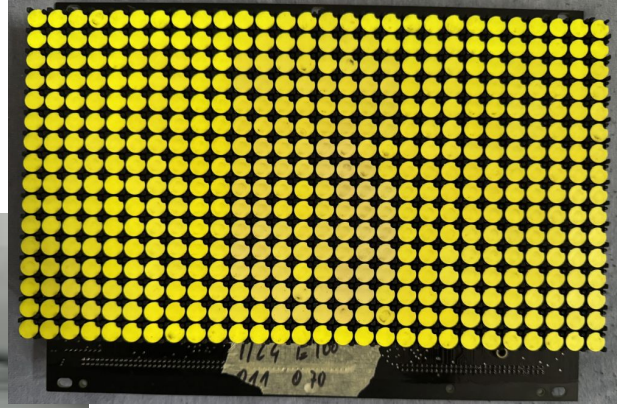

Flipping Dots
A Project by Tim Herr (32060)

The Project Idea

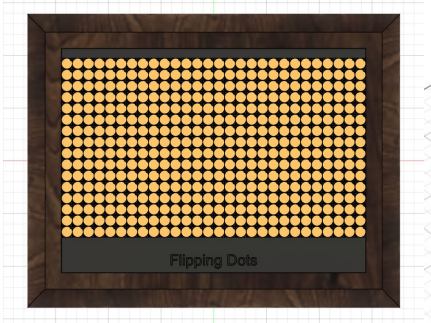


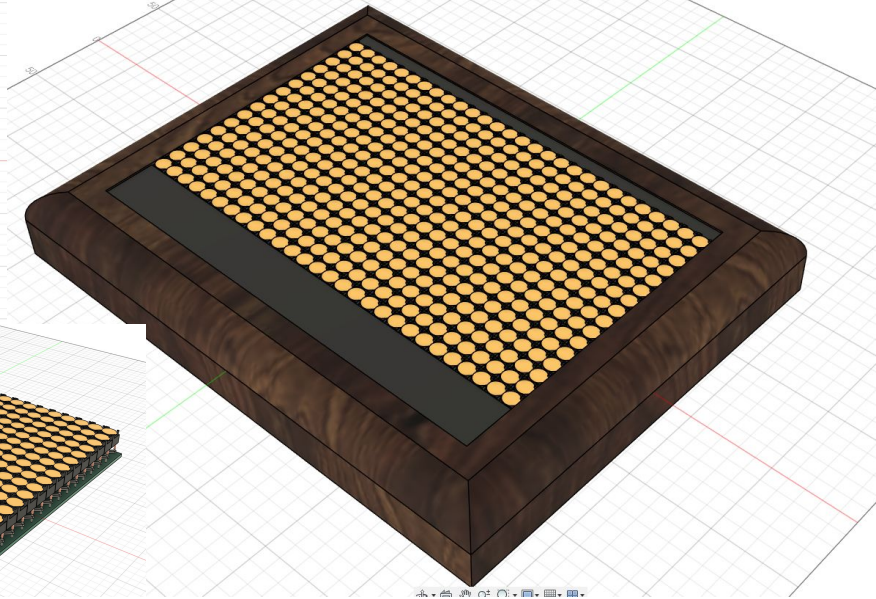


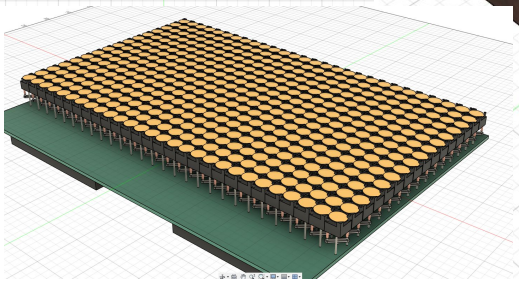
- Saw a cool Youtube Video
- Bought One immediately
- This was Christmas 2024…

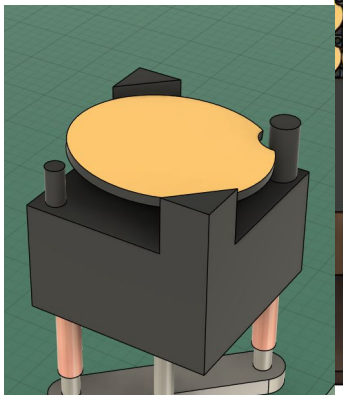
First Sketch

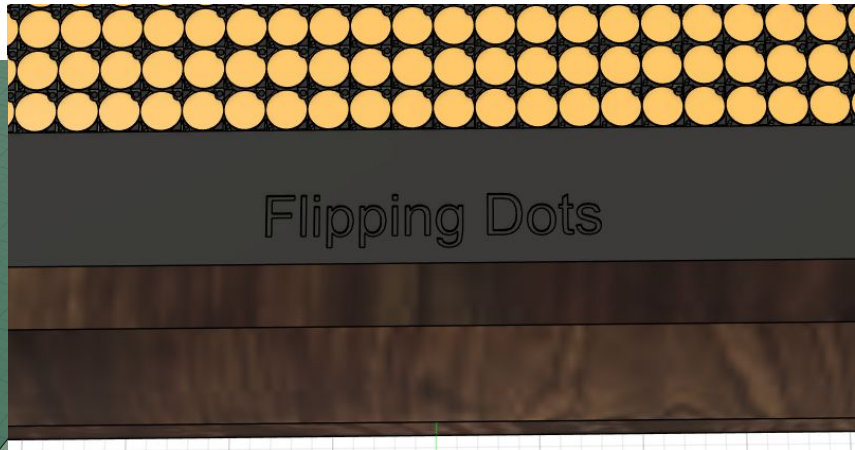
- Wall mounted or stood upright
- Nice wooden Frame
- All Circuitry hidden











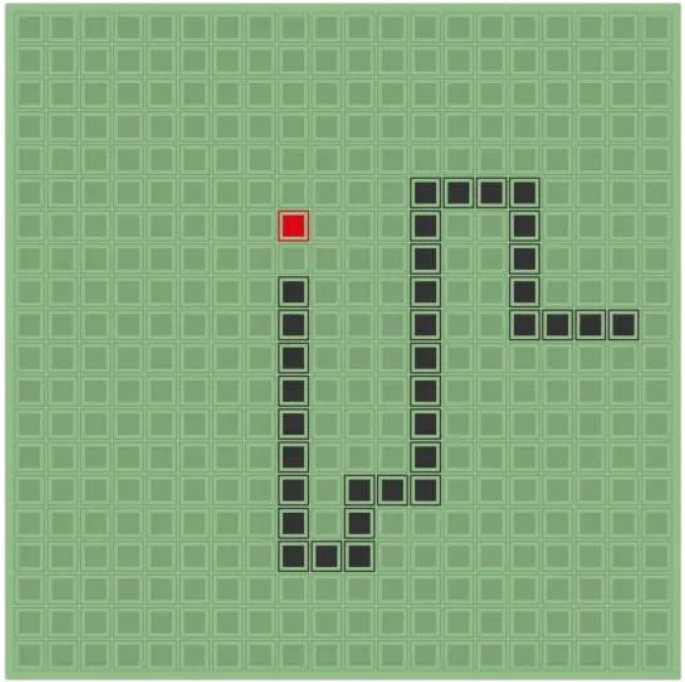
Intended Functionality

- Many different ideas / possibilities
- Display animations (game of life?)
- Array of pictures to change each morning

- had to have one input device

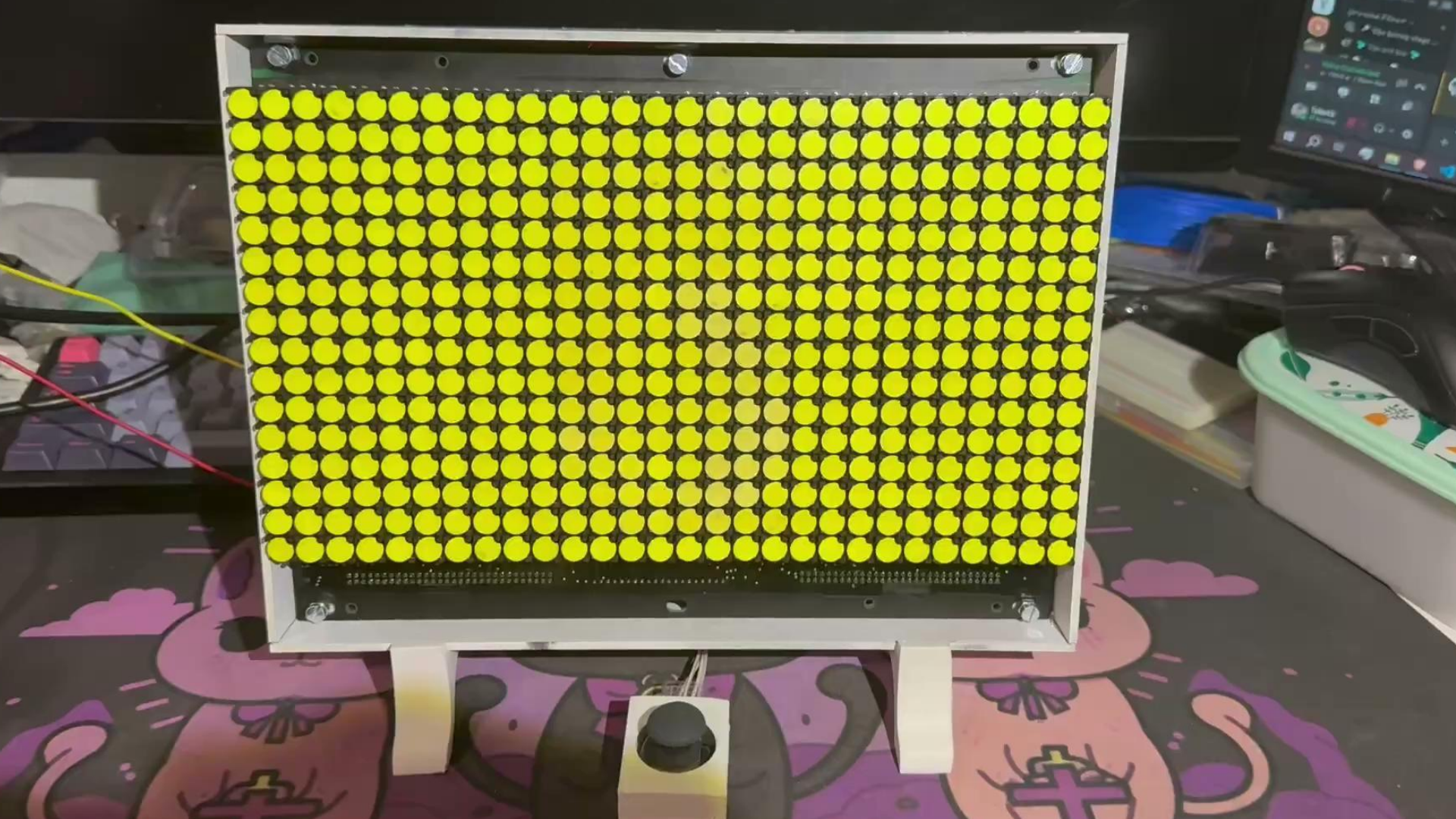
  > retro games

  > SNAKE

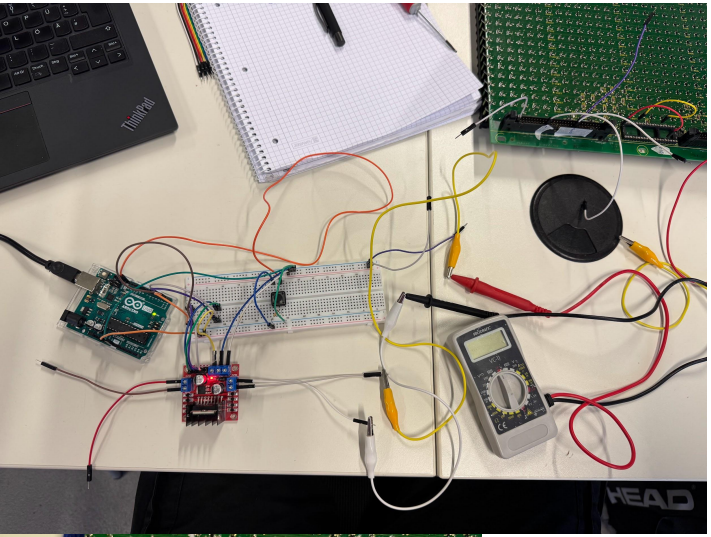


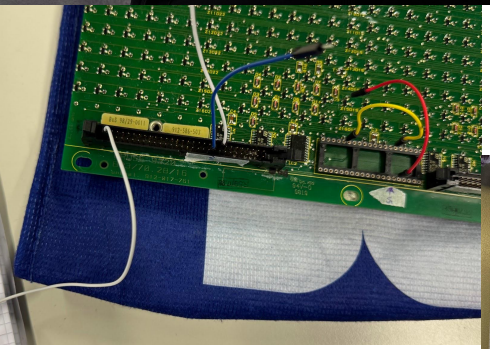
Actual Function

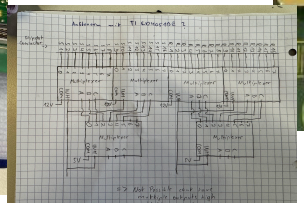
Time for a live demo?

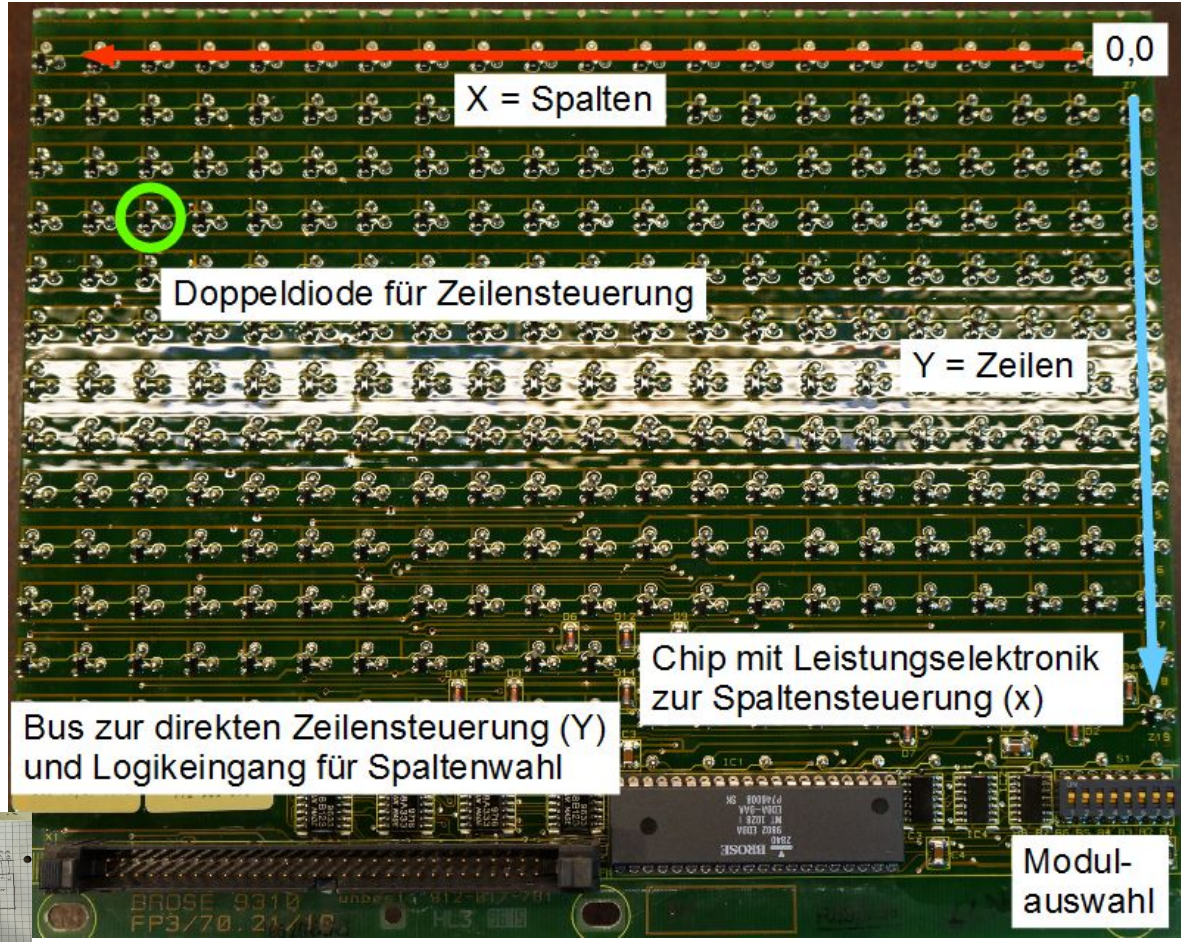


How did we get here?



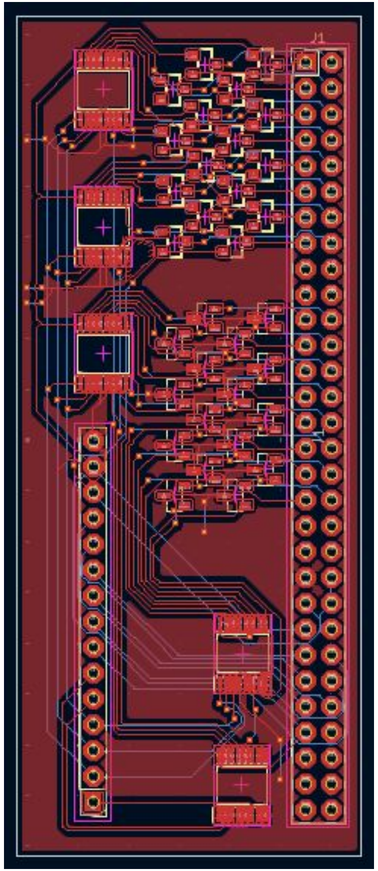


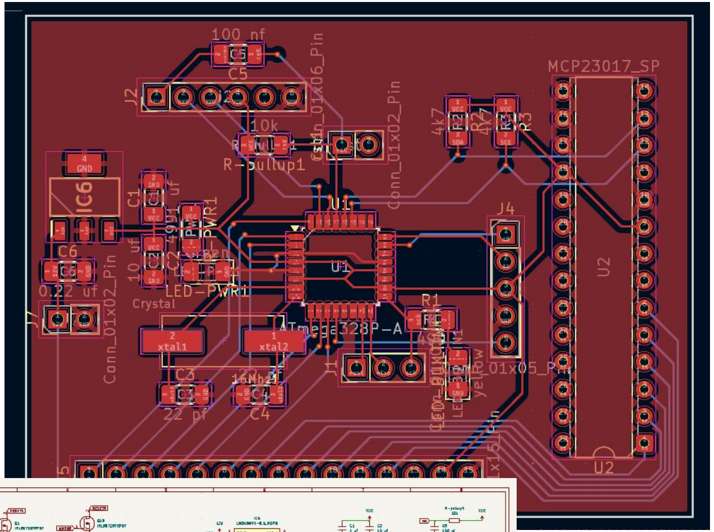


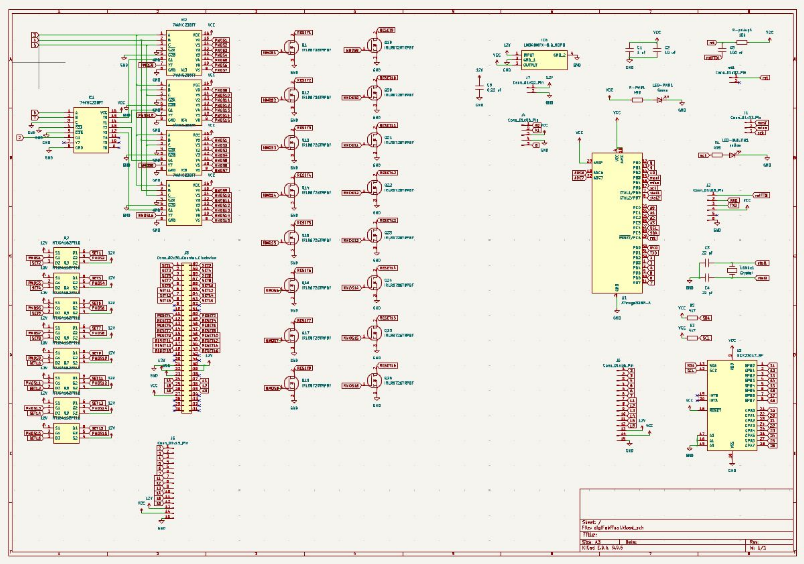


https://radow.org/img/flip-dot/brose-13x21-rund-hinten-demo.png

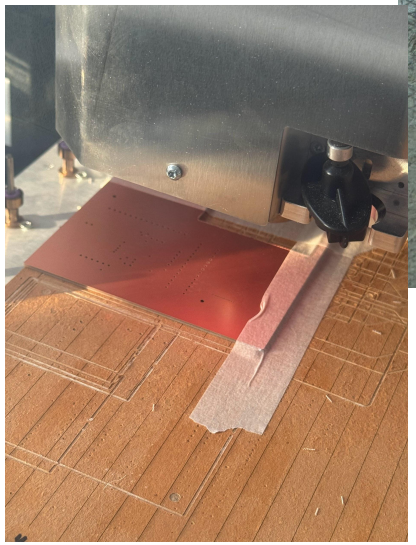
PCB Design

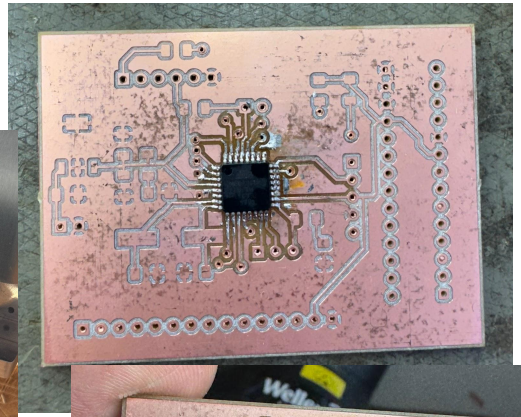

J1

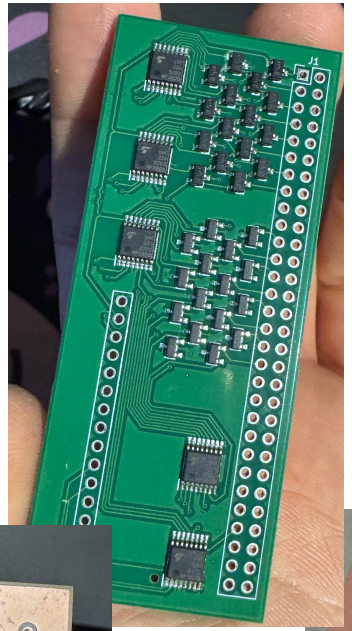

100 nf
C5
J2
10k
R-pullup1
MCP23017_SP
4k7
R2
R3
C1
U1
J4
U2
C6
0.22 uf
Crystal
xtal1
xtal2
ATmega328P-A
R1
C3
22 pf
C4
LED-PWR1

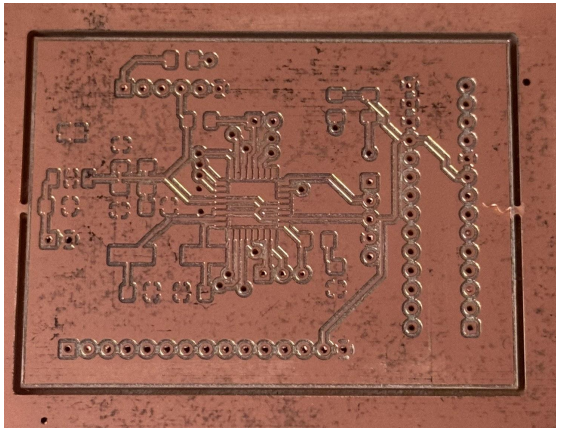


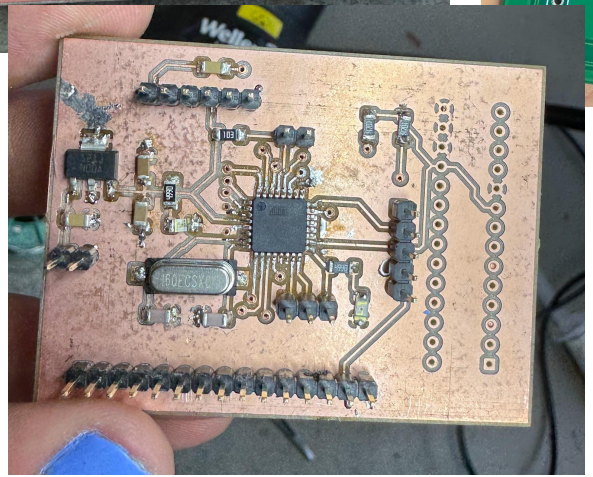
PCB Manufacturing

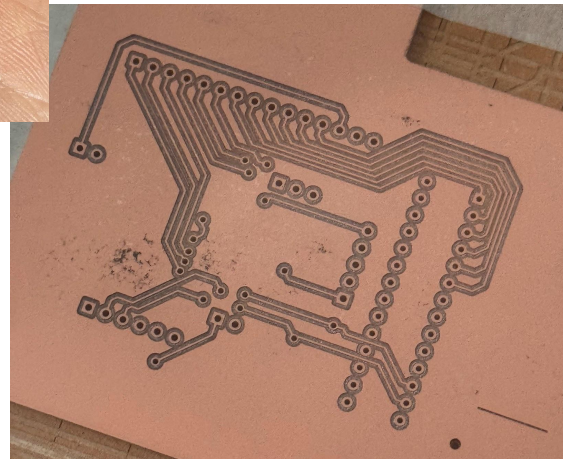




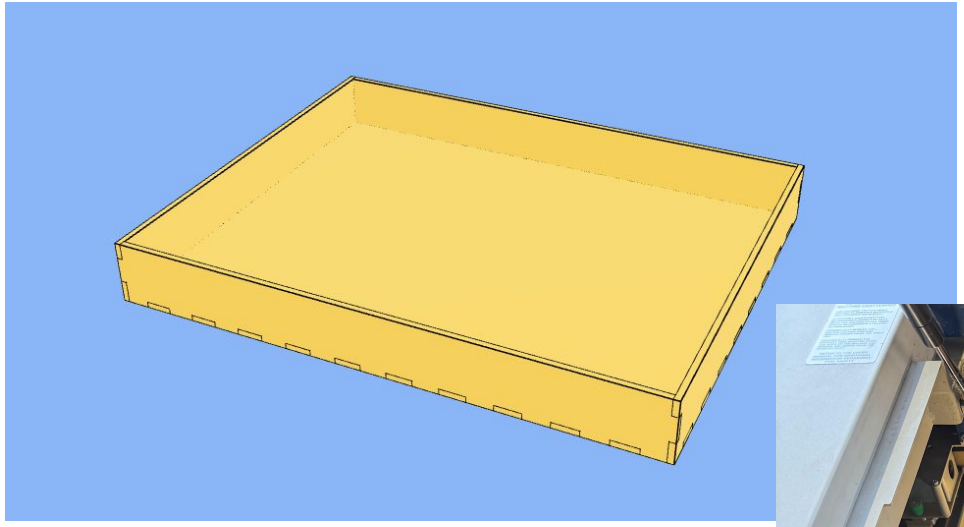


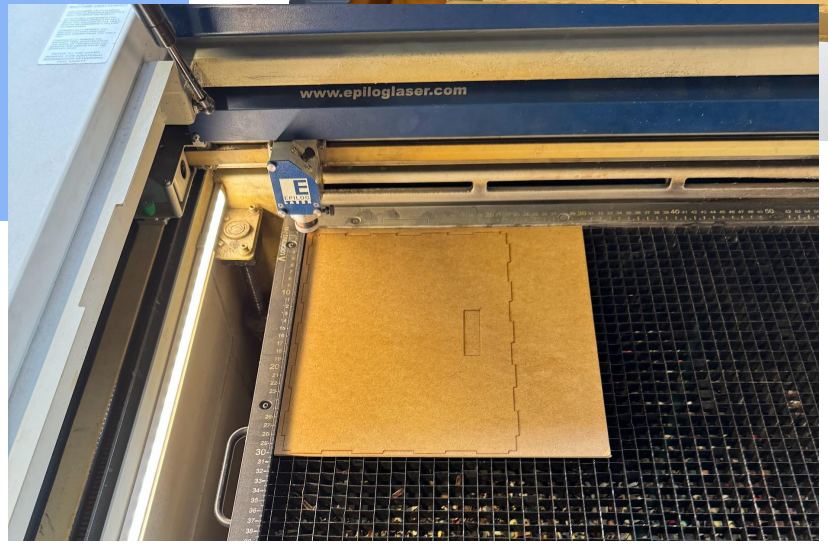




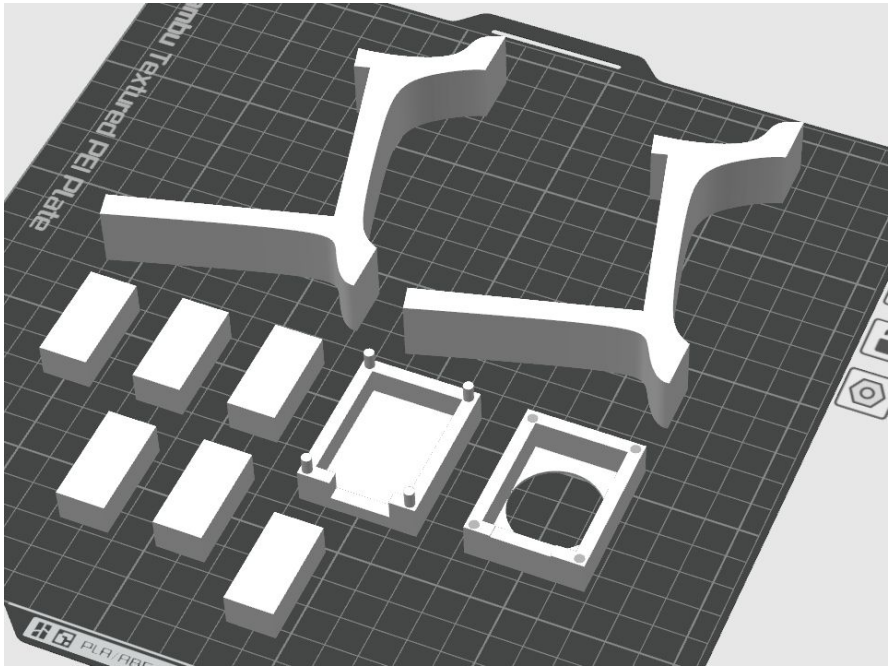


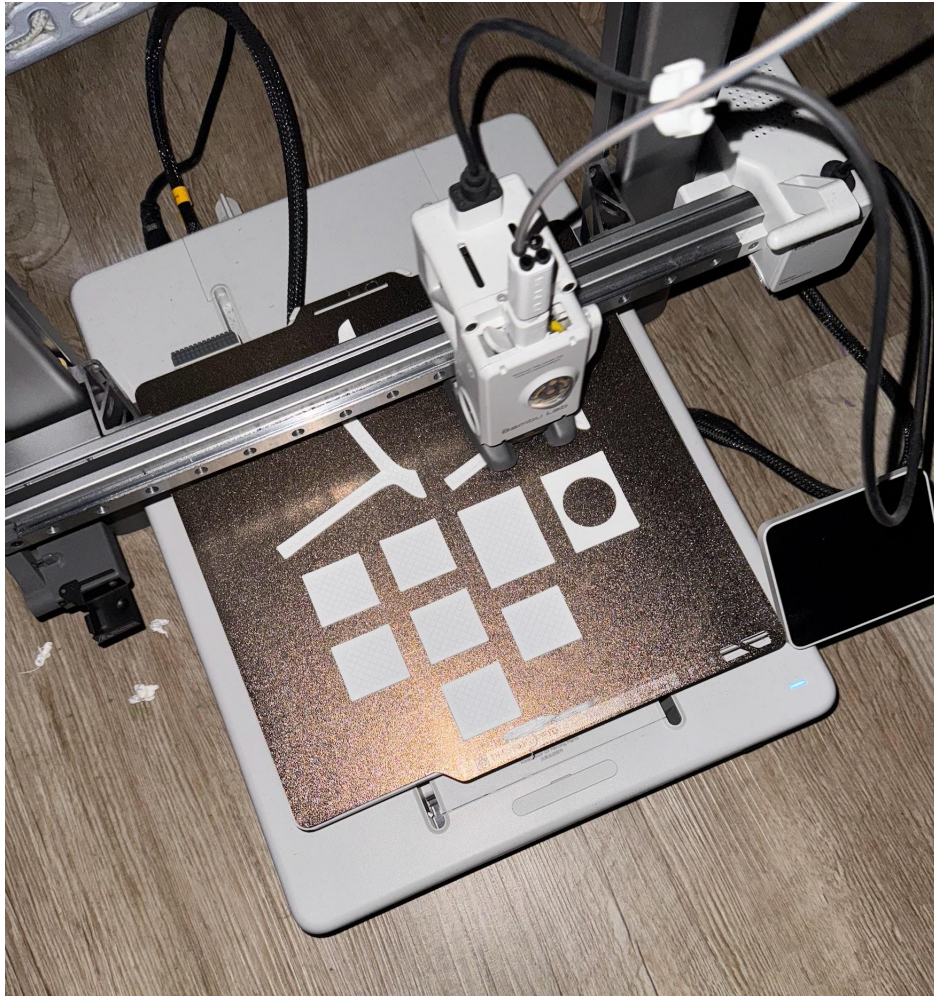
The Case (Laser Cutting)



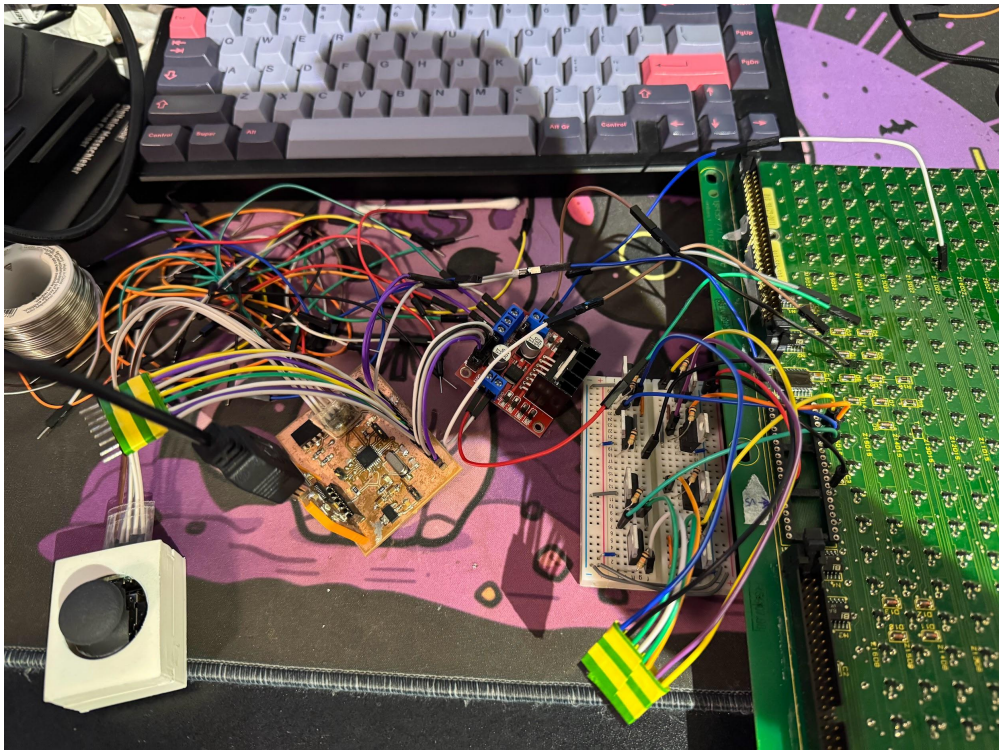


Stands and Supports





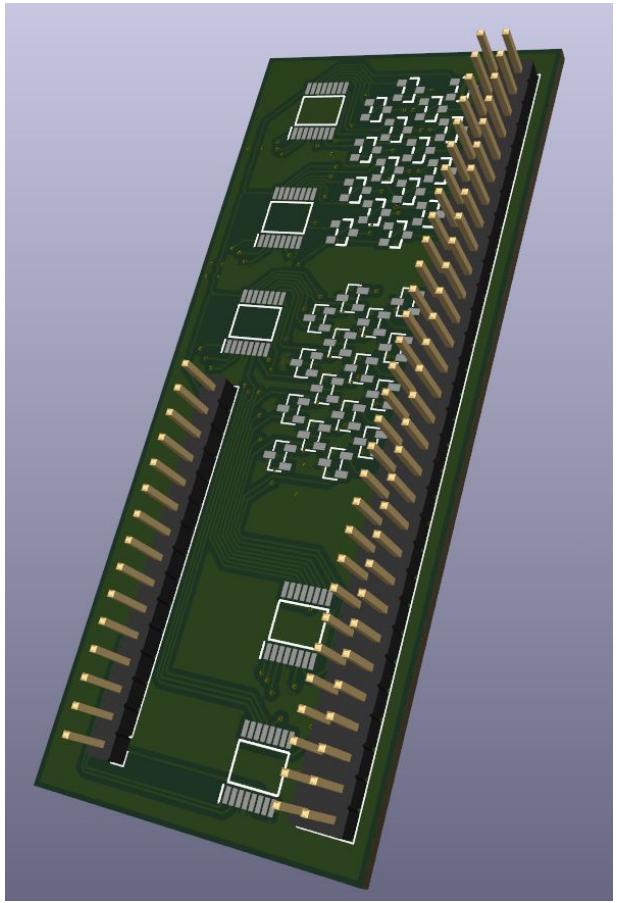
Embedded Programming

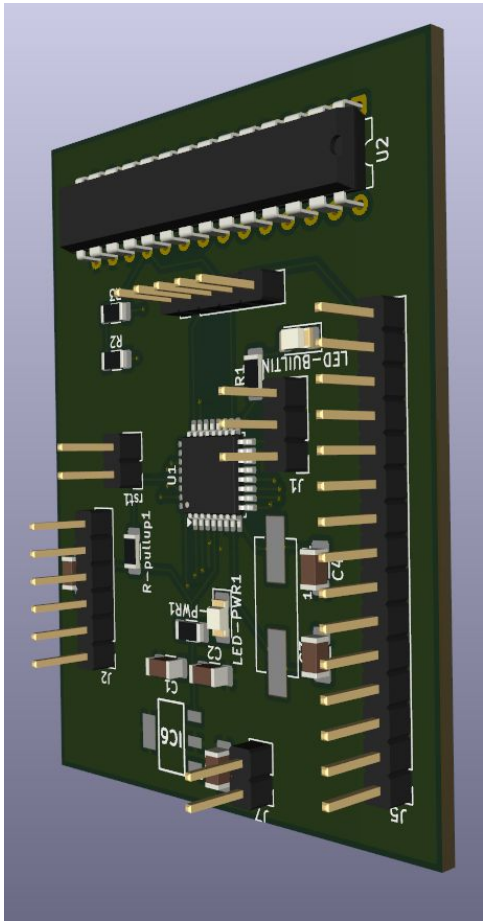


```
// -*- c++ -*-

#define SDA_PORT PORTC
#define SDA_PIN 5
#define SCL_PORT PORTC
#define SCL_PIN 4
#define I2C_TIMEOUT 100
#define I2C_FASTMODE 1

#include <SoftWire.h>

//pins to address flip dot (via hbridge)
int hBridge1 = 5;
int hBridge2 = 4;
int hBridge3 = 3;
int hBridge4 = 2;

//pins to read joystick
int stickPressed = 8;
int stickX = A1;
int stickY = A0;

//stick variables
int buttonState;
int lastButtonState = LOW;
unsigned long lastDebounceTime = 0;
unsigned long debounceDelay = 50;
unsigned long lastStickInputR = 0;
unsigned long lastStickInputL = 0;
unsigned long lastStickInputU = 0;
unsigned long lastStickInputD = 0;
int joystickTimeout = 1000;

//flipdot
bool yellowDots[2] = {true, true};
```

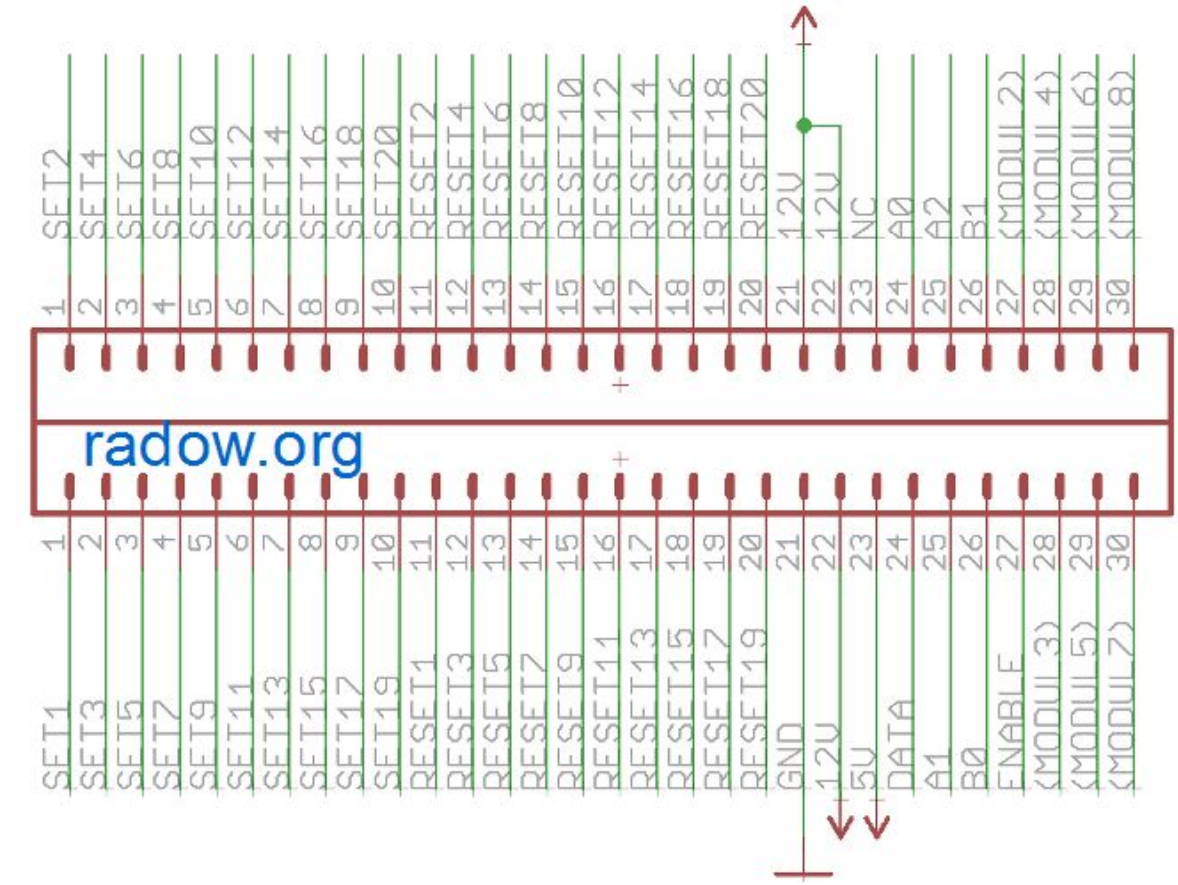
Lessons learned

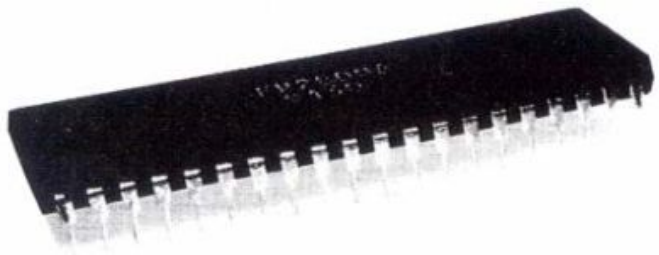
- Test the display more thoroughly beforehand
- Pay special attention to MosFETs when designing circuits
- Choose a project with less scope creep
- Less hubris

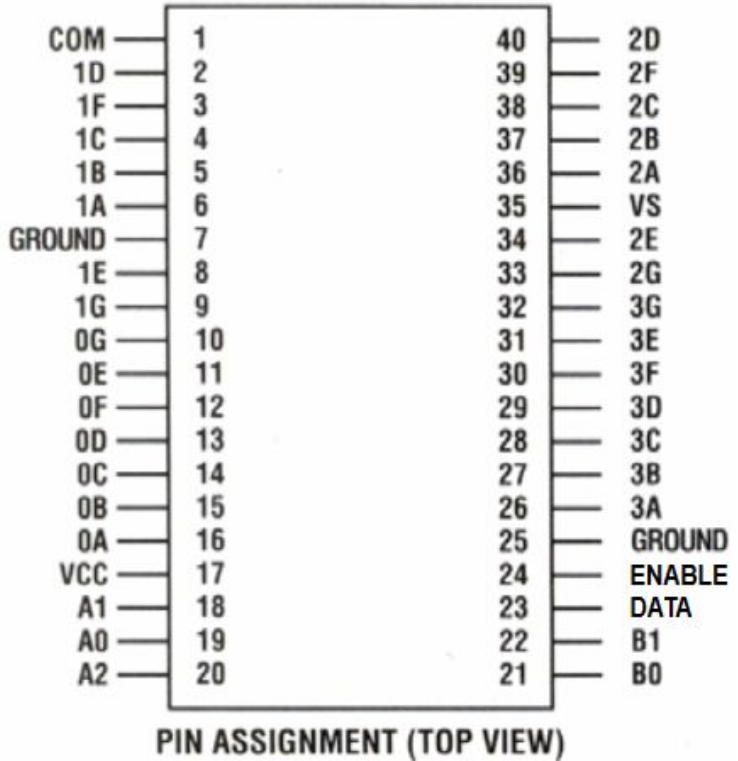





FIN







PIN ASSIGNMENT (TOP VIEW)