

BSIDES SLC 2021 BADGE

@PROFESSOR_PLUM

DESIGN

- 8-bit PIC microcontroller
- 128x64 pixel OLED Display
- IR Receiver/Transmitter
- Accelerometer
- 2x Potentiometers as primary input
- Artwork by my daughter



CHIP SHORTAGES

2019

2020

2021

STM32L072CBT6

Mouser #: 579-STM32L072CBT6
Mfr. #: STM32L072CBT6

PIC16LF18346T-I/SS

Mouser #: 579-PIC16LF18346TISS
Mfr. #: PIC16LF18346T-I/SS
Mfr.: Microchip Technology
Customer #: Customer #
Description: 8-bit Microcontrollers - MCU
10b ADC 2x(SPI/I2C)
[View in Development Tool](#)
Datasheet: [PIC16LF18346T-I/SS Datasheet](#)
ECAD Model: [Build or Request PCB Footprint or Symbol](#)
Download the free [Library Loader](#) to convert this file to your EDA Tool. [Learn more about ECAD Model.](#)
More Information: [Learn more about Microchip PIC16LF18346T-I/SS](#)

Availability

Stock: 0 Notify me when product is in stock.
You can still purchase this product for backorder.

Expected 1/13/2022
TBD

Weeks: 52 Weeks ?

Multiples: 1

Unit Price \$6.36
Ext. Price \$6.36

Price \$5.72
Ext. Price \$57.20

Price \$5.41
Ext. Price \$135.25

Compare Product **Add To Project**

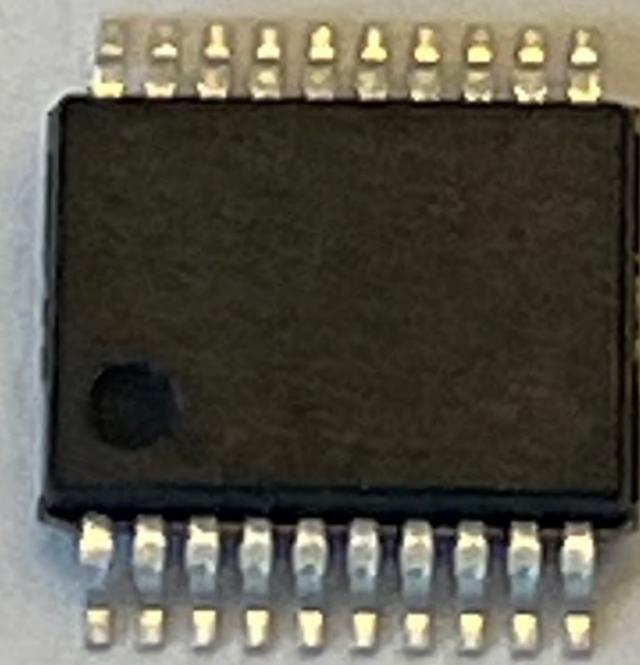
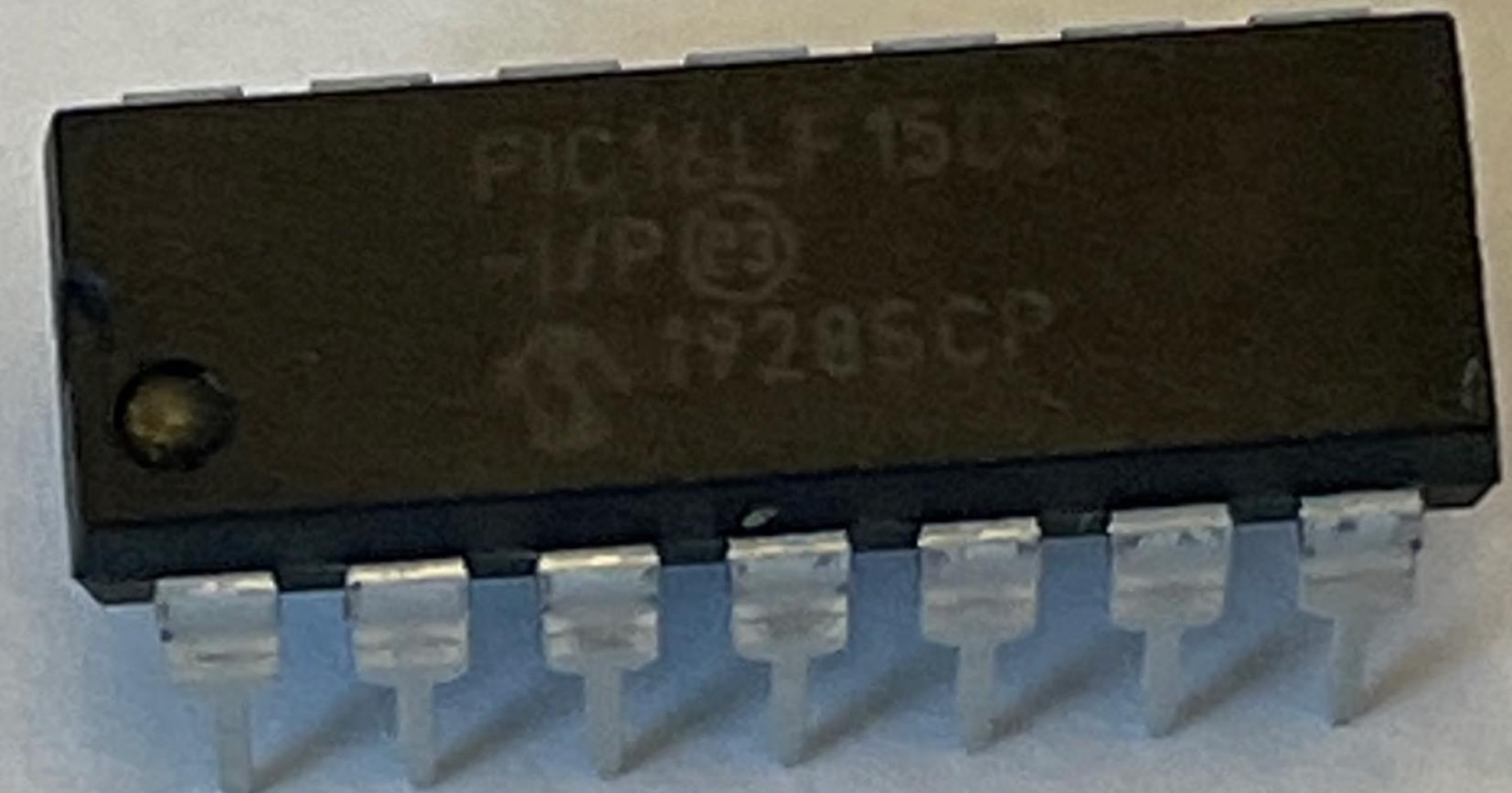
1 Hour Here Is 7 Years on Earth

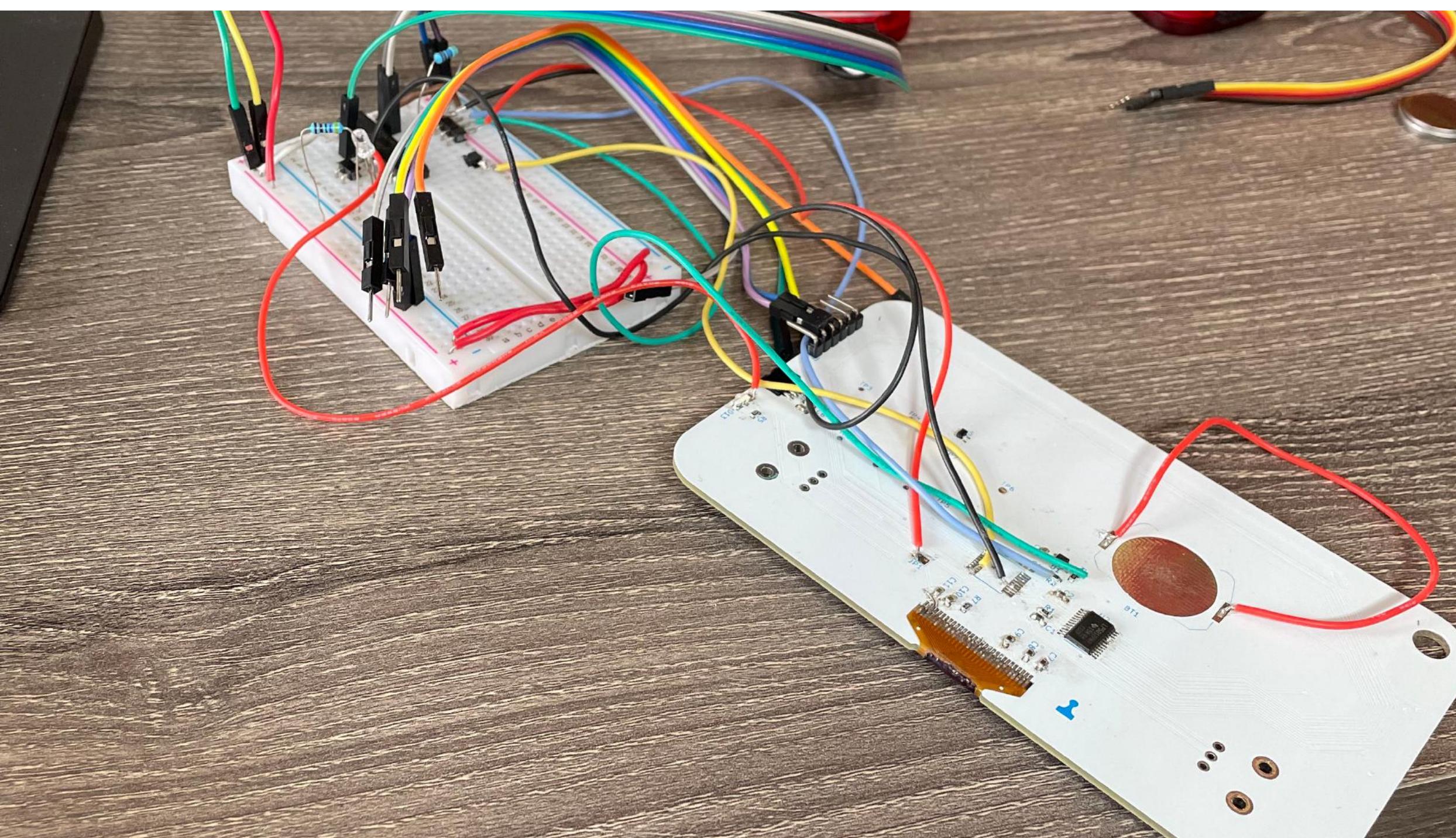
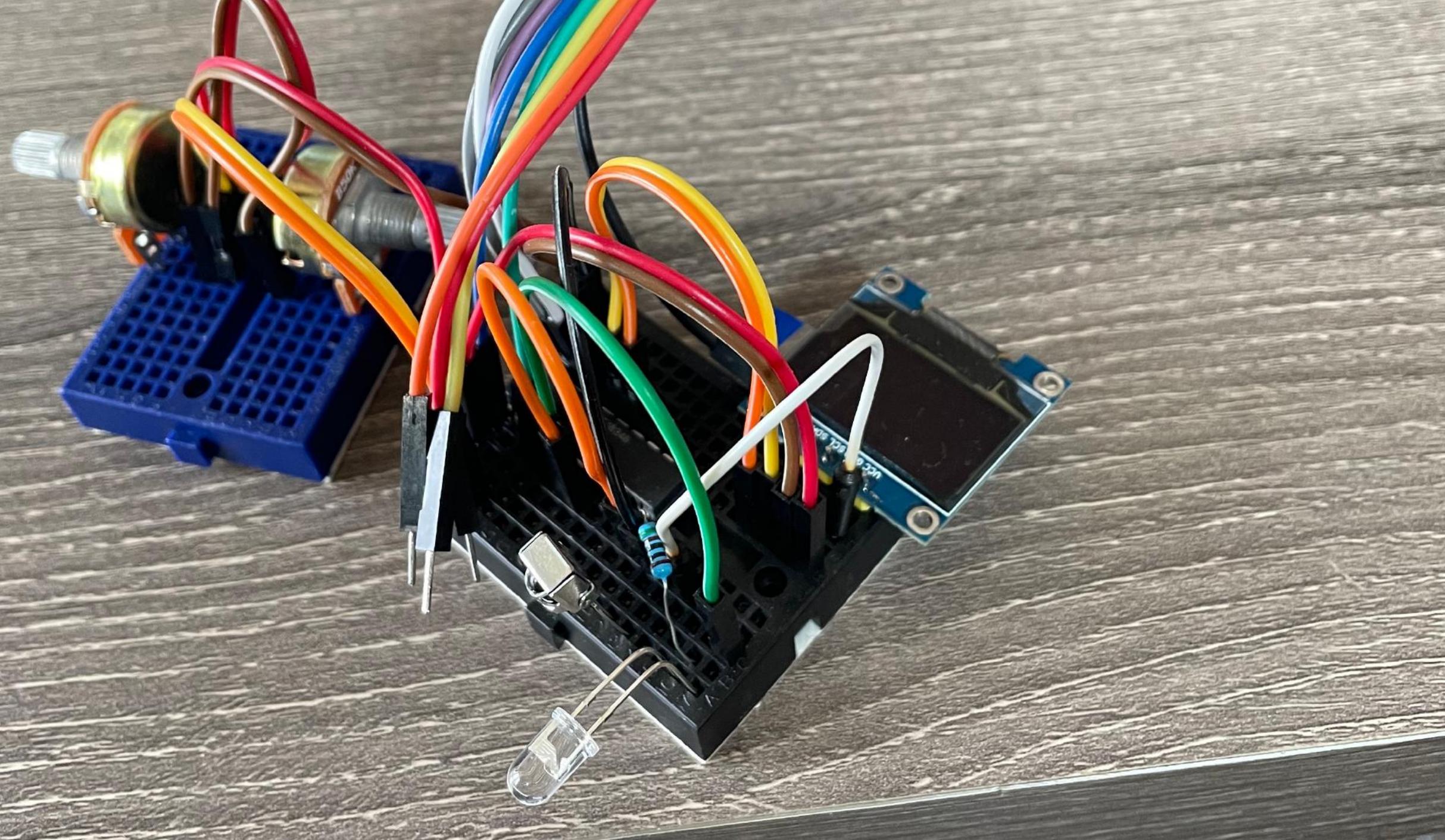
Good, We'll wait here until the chip crisis ended

MCU

PIC16 8-BIT LOW POWER MCU

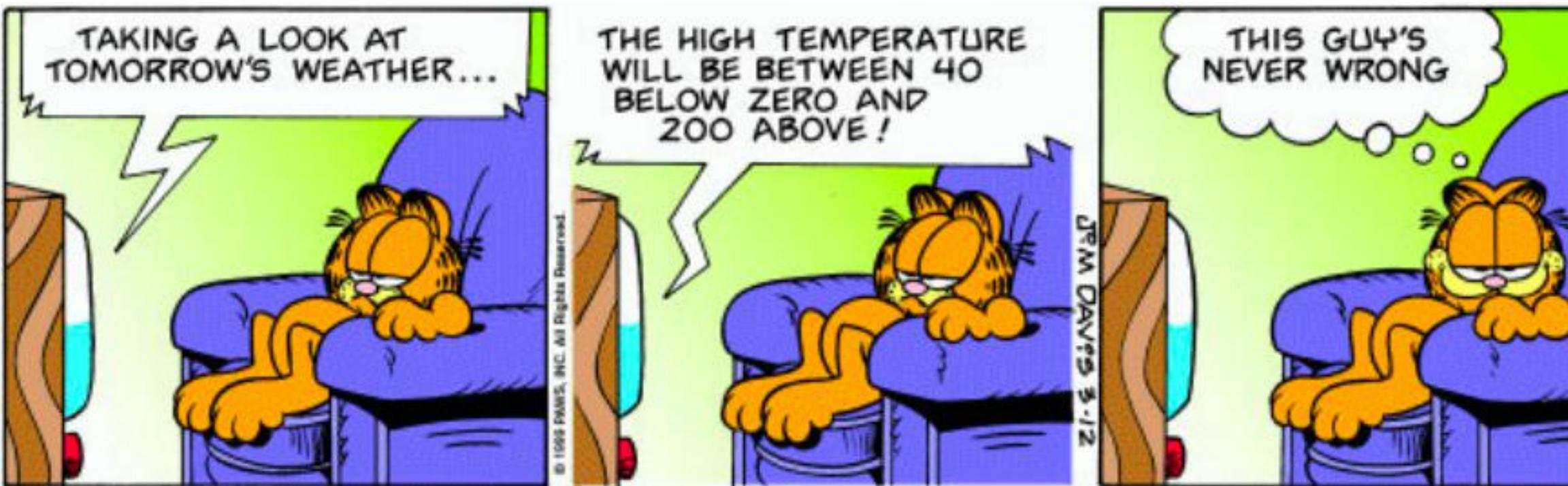
- 16K “Words” FLASH
- 2KB RAM
- 256B EEPROM
- Extremely low power
 - 1.1mA @ 32Mhz
 - 40nA while Sleeping
- Extended Range Version due to limited supplies





TEMPERATURE SENSOR

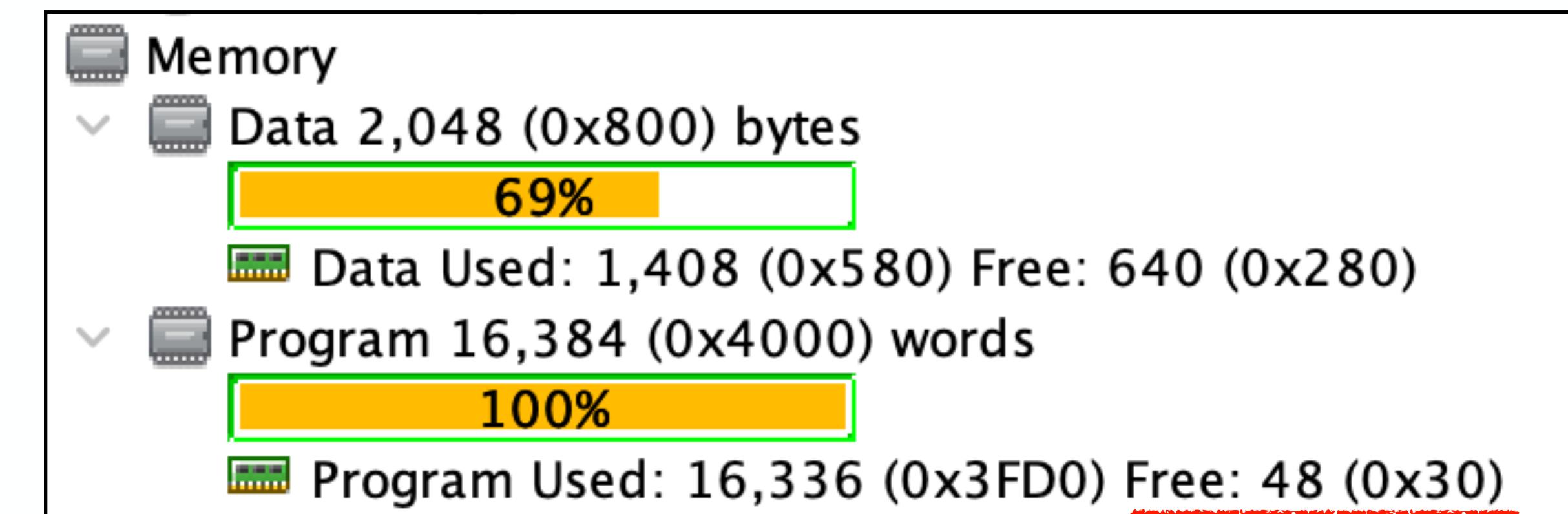
Generally this equation will produce an uncalibrated temperature value that is within 100°C of the actual temperature. Part to part variations and application variation will usually cause the calculated temperature reading to fluctuate. A temperature value for this offset needs to be added to [Equation 3](#) to account for this variation.



OPTIMIZATIONS

16KB ~= 1KB PER CHALLENGE

- Remove debugging support
- Build optimized for size
- Avoid common runtimes
 - `printf`, `strcpy`, `memcpy`, `memcmp`, etc...
- Micro optimizations



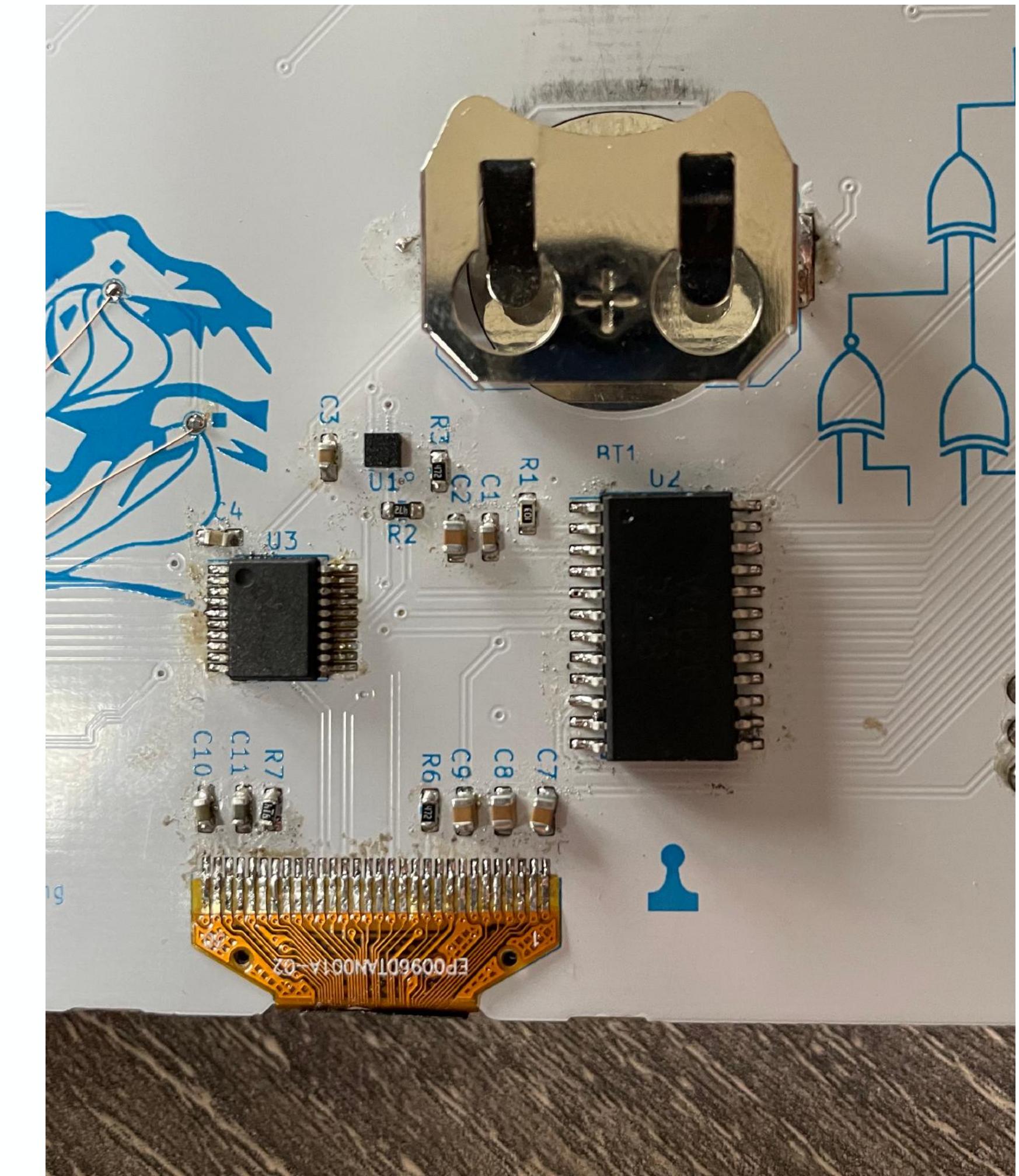
```
| for (int i=0; i<16; ++i) {  
|     int16_t dx = treesx[i];  
|     treesx[i]-=3;  
|     uint8_t dy = treesy[i];  
|     if ((dx>-5) && (dx<128))
```

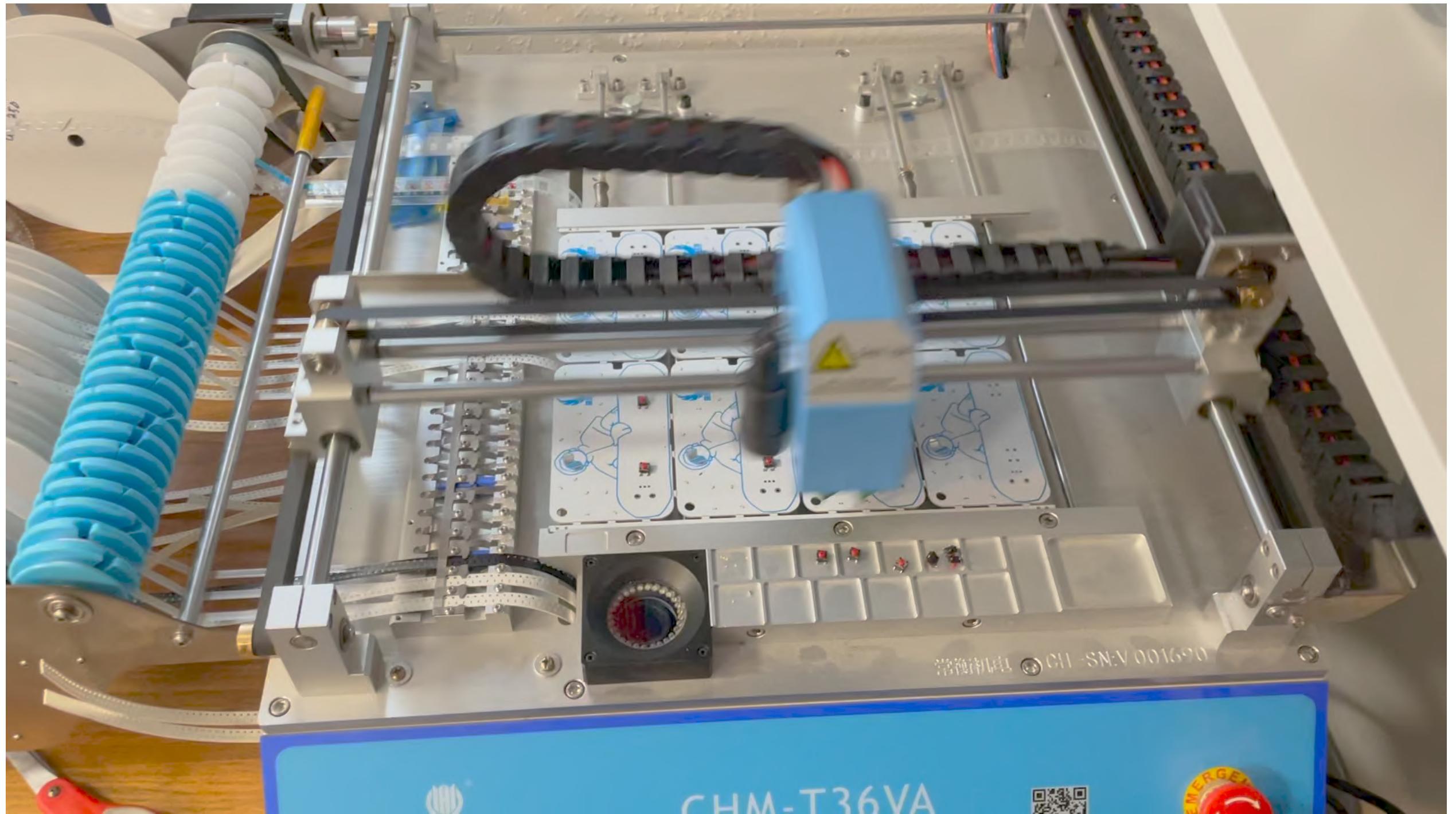
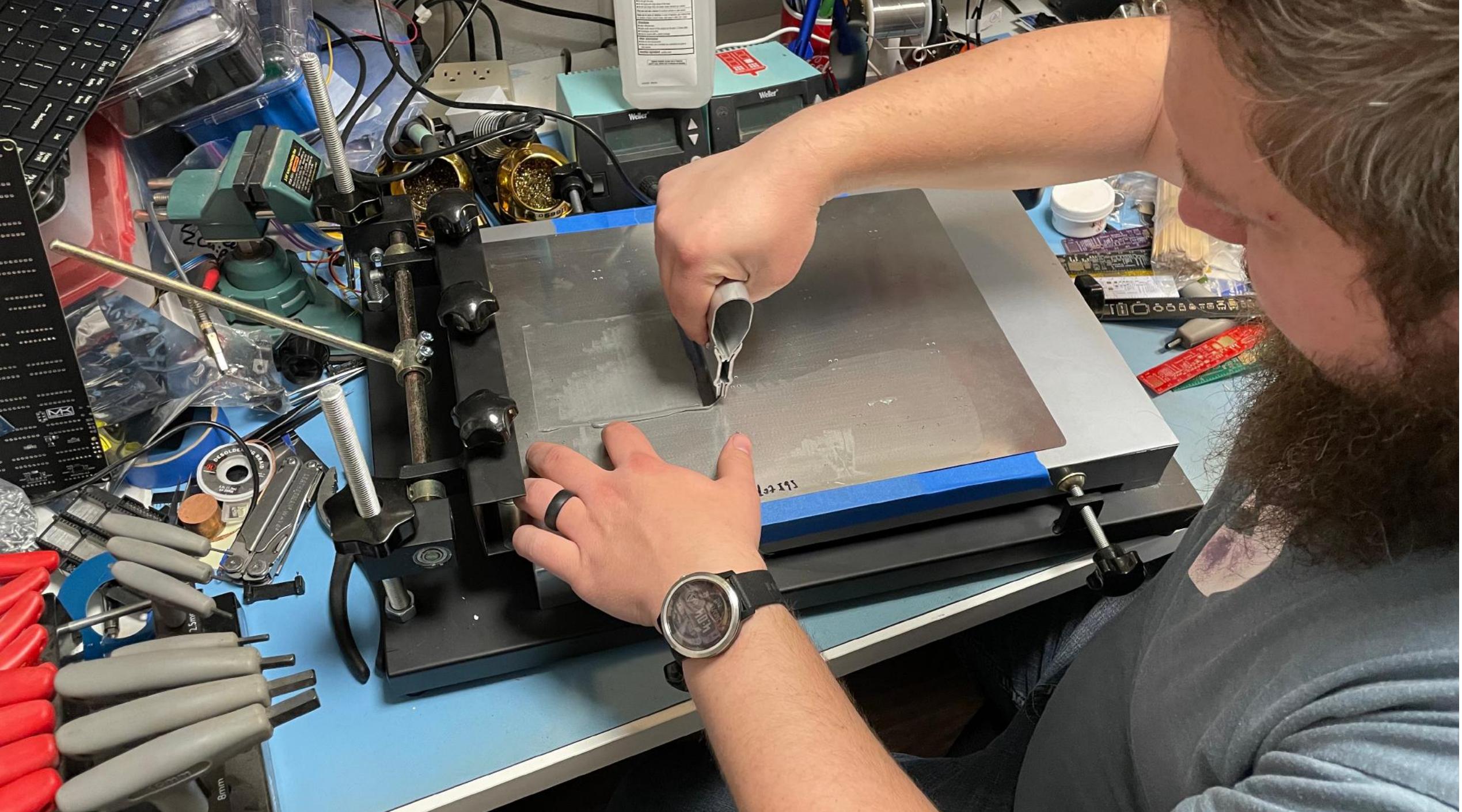
+10 Bytes

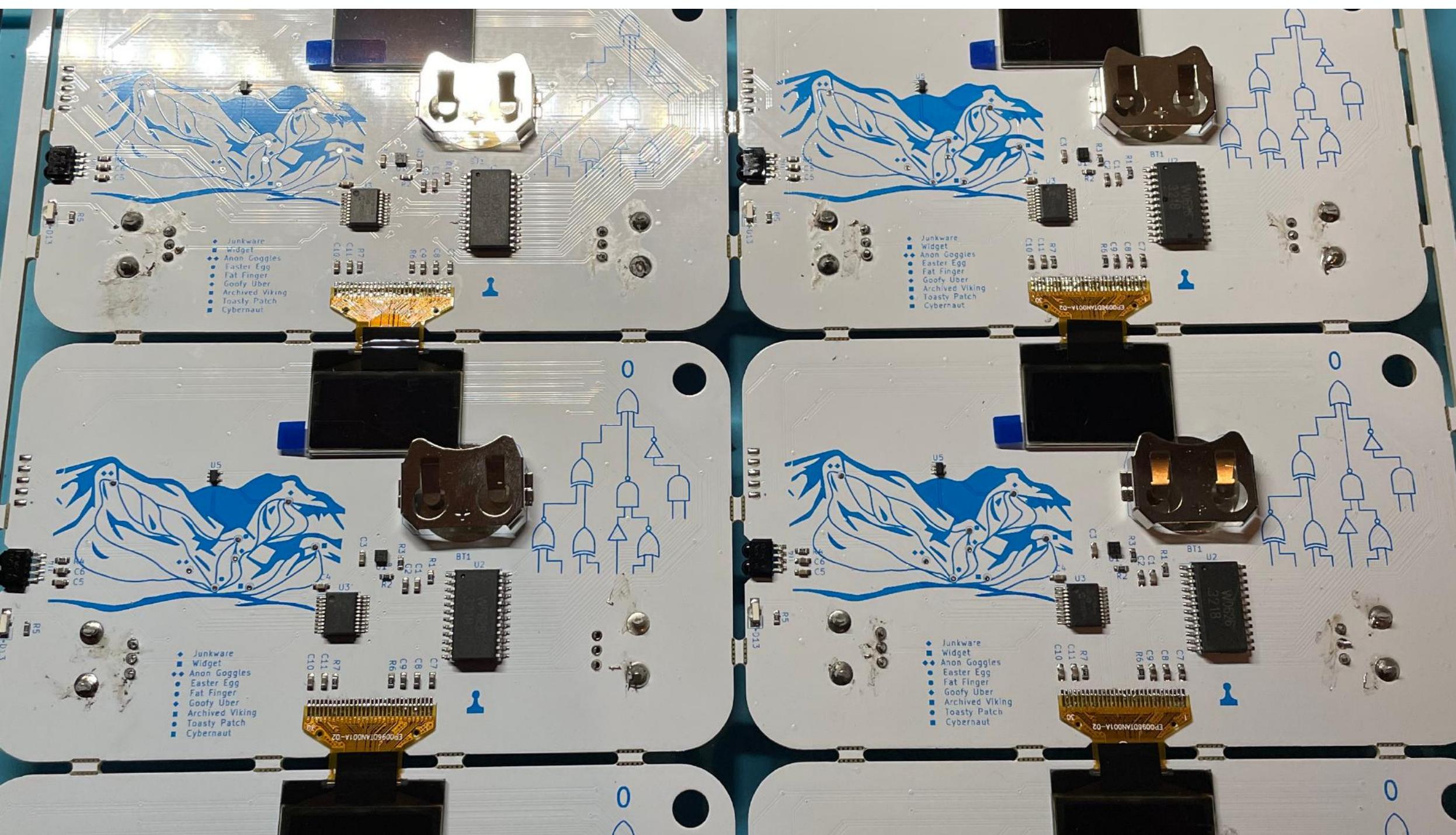
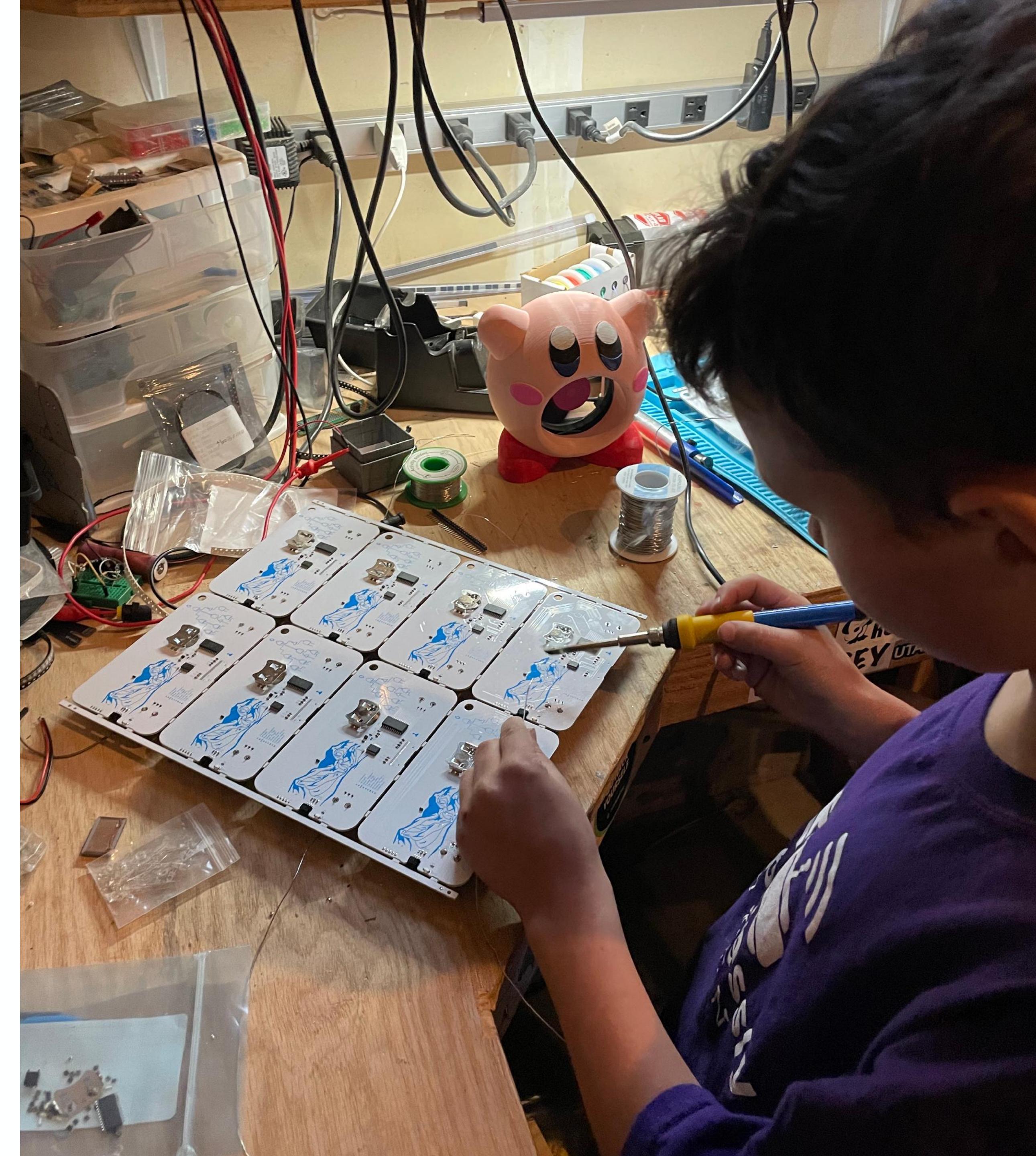
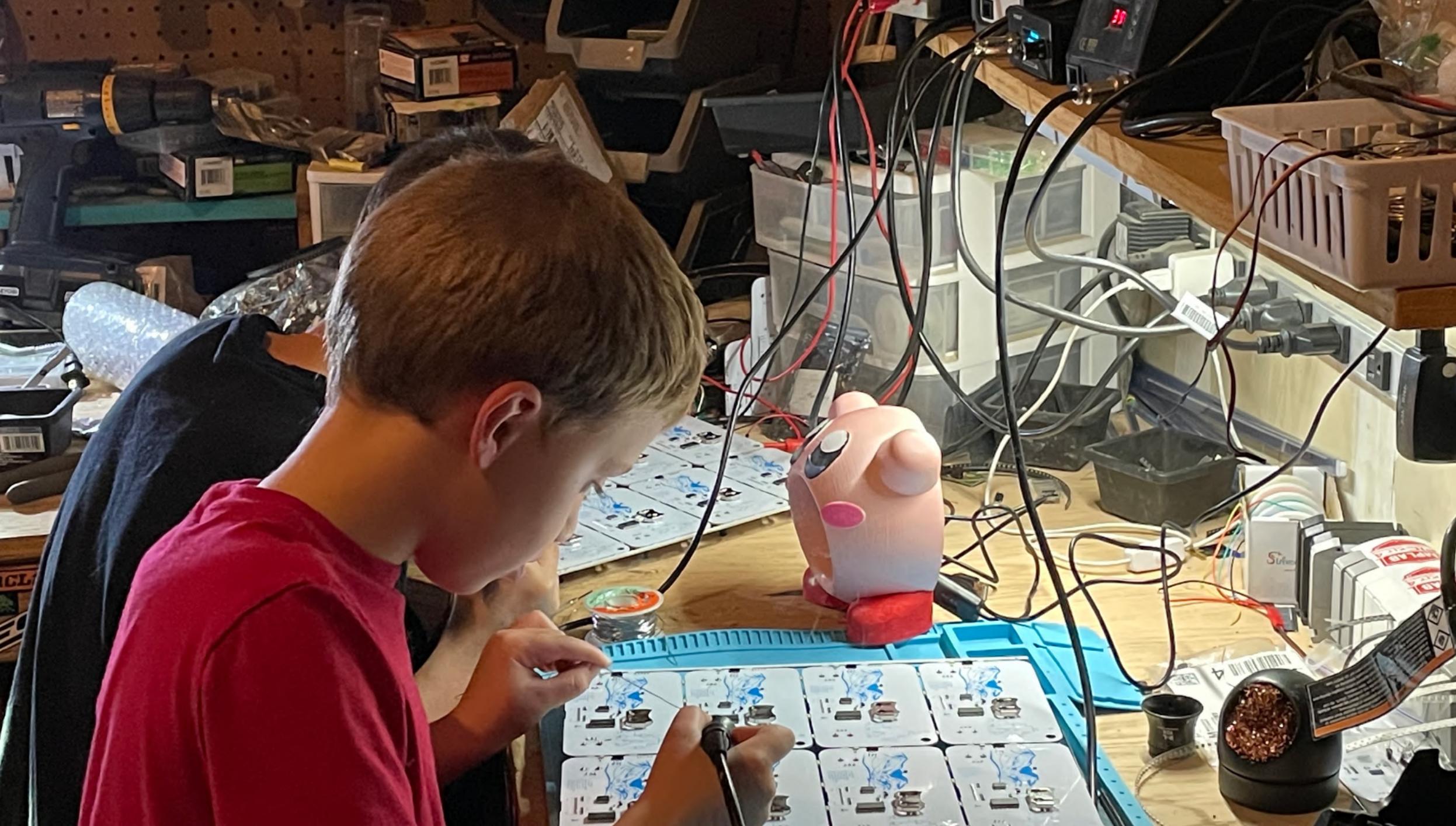


```
for (uint8_t i=0; i<16; ++i) {  
    int16_t dx = treesx[i];  
    treesx[i]-=3;  
    uint8_t dy = treesy[i];  
    if ((dx>-5) && (dx<128))
```

MORE CHIP SHORTAGES



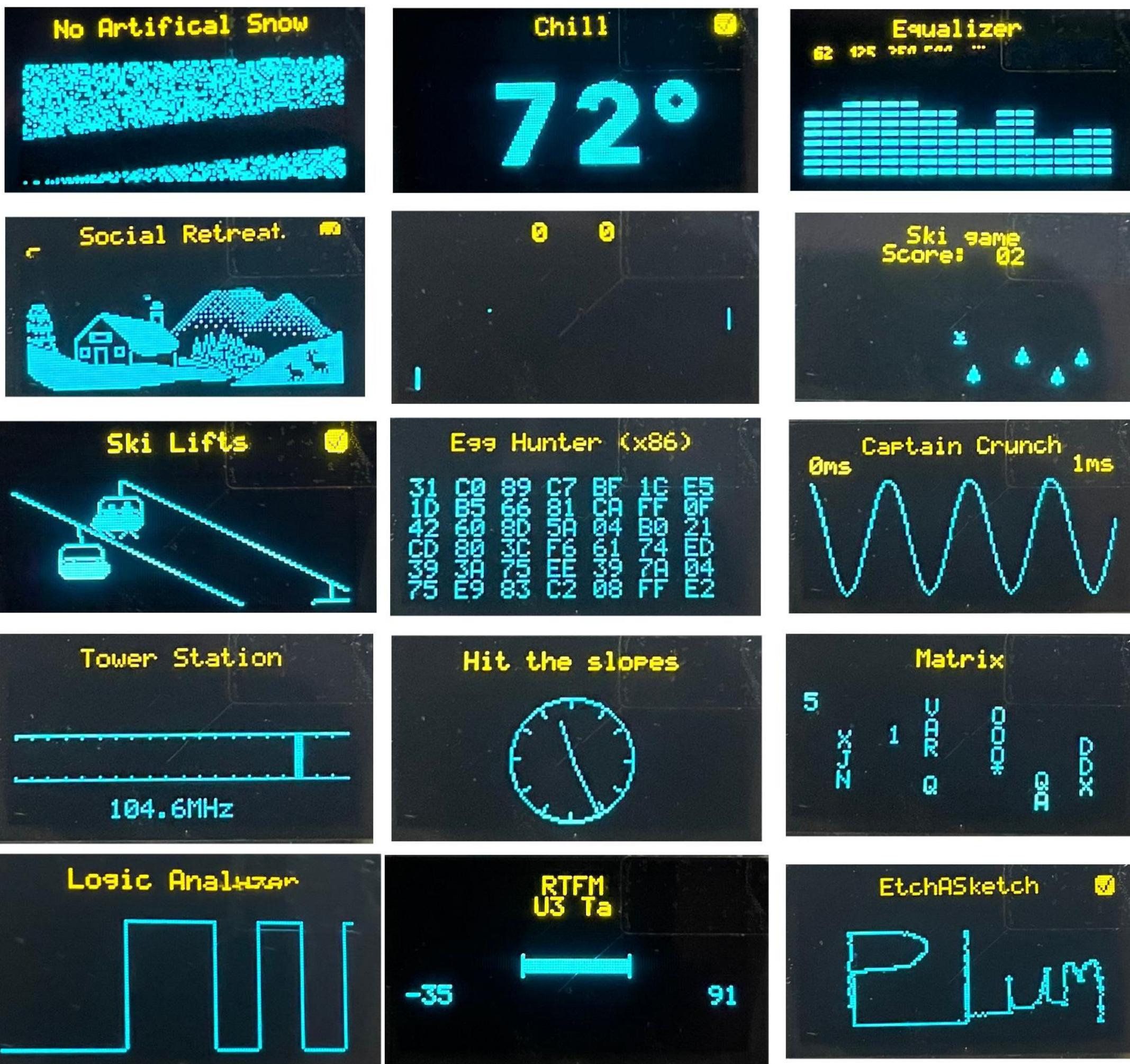




CHALLENGES

15 PUZZLES, EACH CORRESPONDS TO A LED

- Triva
 - Cryptography
 - Signal analysis
 - Hardware
 - Shell coding
 - Logic Puzzles
 - Soldering
 - Others



ERRATA / HINTS

BUMNYHILL

Typo is on purpose. The correct spelling
would not produce a working determinate...

BASS	MDS	HIGHS
12345678	✓ X XXX	
63249364	XX	
13579753	✓ X	
28862433	XXX XX	
88456957	✓✓✓ XXX	
98765432	XXX XX	
61685918	✓ XX	
55555555	✓✓✓	
71547864	XX XX	
56123583	✓✓ XXX	
22911942	XX	
15235817	✓ XX	