Wrocław University
of Science and Technology

Microcontrollers Projekt

Rafał Cielenkiewicz
Supervisor : dr inż. Andrzej grobelny
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Contents

1 Component selection

1.1 Usb c port (10164359-00011LF 2,15 zł)

- Voltage Rating: 5 V
- Current Rating: 3 A
- Number of Contacts: 6

1.2 Temperature Sensors (595-TMP1826NGRR 15,46 zł)

- Supply Voltage - Min: 1.7 V
- Supply Voltage - Max: 5.5 V
- Accuracy: +/- 0.2°C
- Minimum Operating Temperature: -55°C
- Maximum Operating Temperature: +150°C

1.3 Microcontroller (511-STM32C031C4T6 8,43 zł)

- Program Memory Size: 16 kB
- Number of I/Os: 45 I/O
- Data RAM Size: 12 kB
- Supply Voltage - Min: 2 V
- Supply Voltage - Max: 3.6 V
- Minimum Operating Temperature: -40°C
- Maximum Operating Temperature: +85°C
- Interface Type: I2C
- Operating Supply Voltage: 2 V to 3.6 V
- Program Memory Type: Flash

1.4 Voltage Regulators(511-LD1117V33 3,32 zł)

- Output Voltage: 3.3V
- Maximum Output Current: 0.8A
- Positive Voltage Regulator

1.5 Tactile Switche (506-1571220-1 3x 4,39 zł)

- Non-Illuminated
- Current Rating: 50 mA
- Voltage Rating DC: 24 VDC

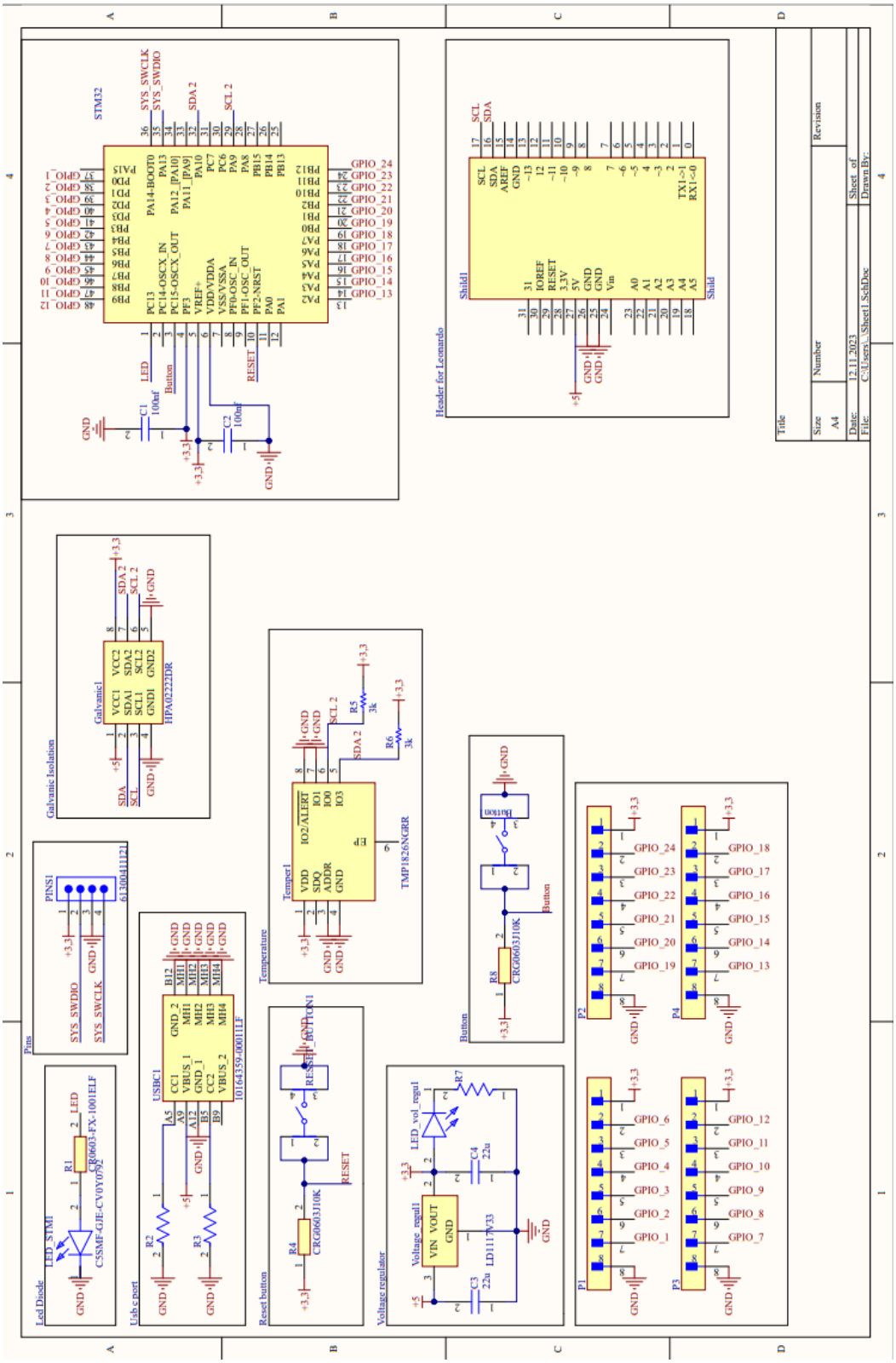
1.6 galvanic isolation (595-ISO1540DR 19,26 zł)

- Supply Voltage - Min: 3 V
- Supply Voltage - Max: 5.5 V
- Operating Supply Current: 2.5 mA, 3.1 mA
- Propagation Delay Time: 70 ns
- Minimum Operating Temperature: -40°C

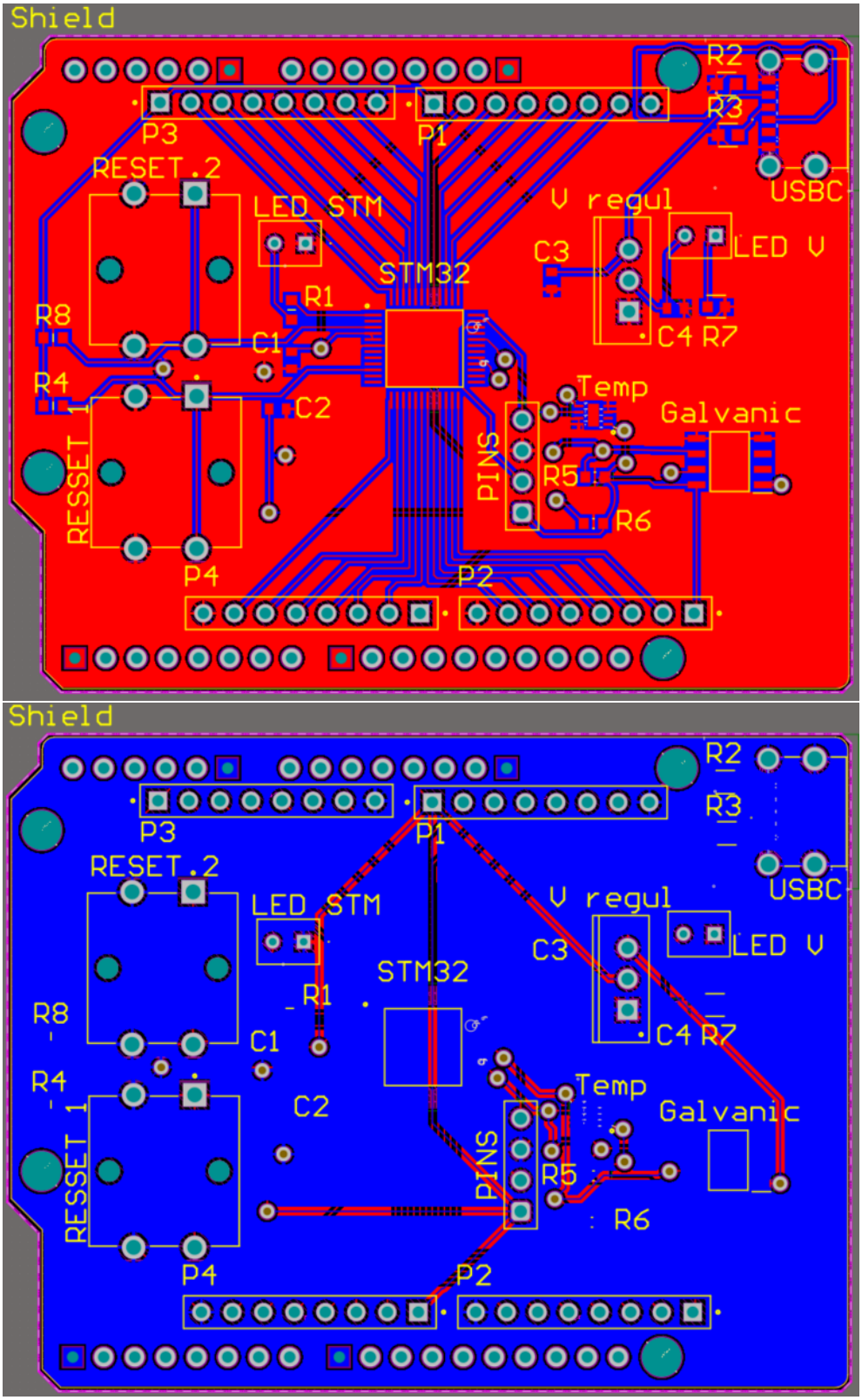
2 Why did i chose it

I decided to choose these components mainly because of the price, availability and delivery time. So it wasn't easy. I decided to choose STM32 instead STM8 because at the same price it seems better and easier to program and I will already have knowledge of its programming which will be useful for me next semester. I also had second sensor accelerometer but I decided not to use it.

3 Schematic



4 PCB


Shield
R2
R3
P3
P1
RESET.2
LED STM
V regul
USBC
LED V
C3
STM32
R1
R8
C1
C4
R7
R4
C2
Temp
Galvanic
PINS
R5
RESSET 1
R6
P4
P2
Shield
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Galvanic
PINS
R5
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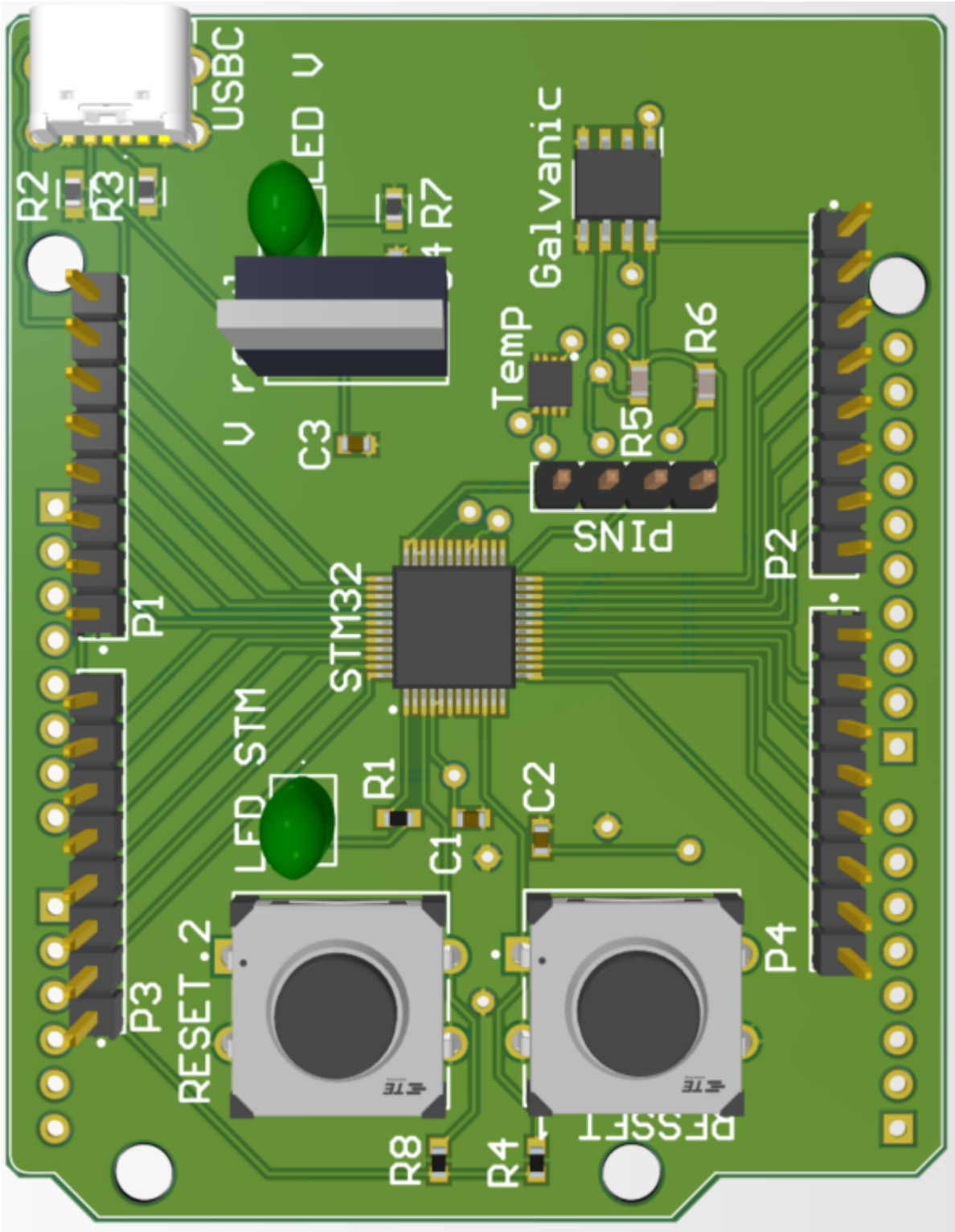
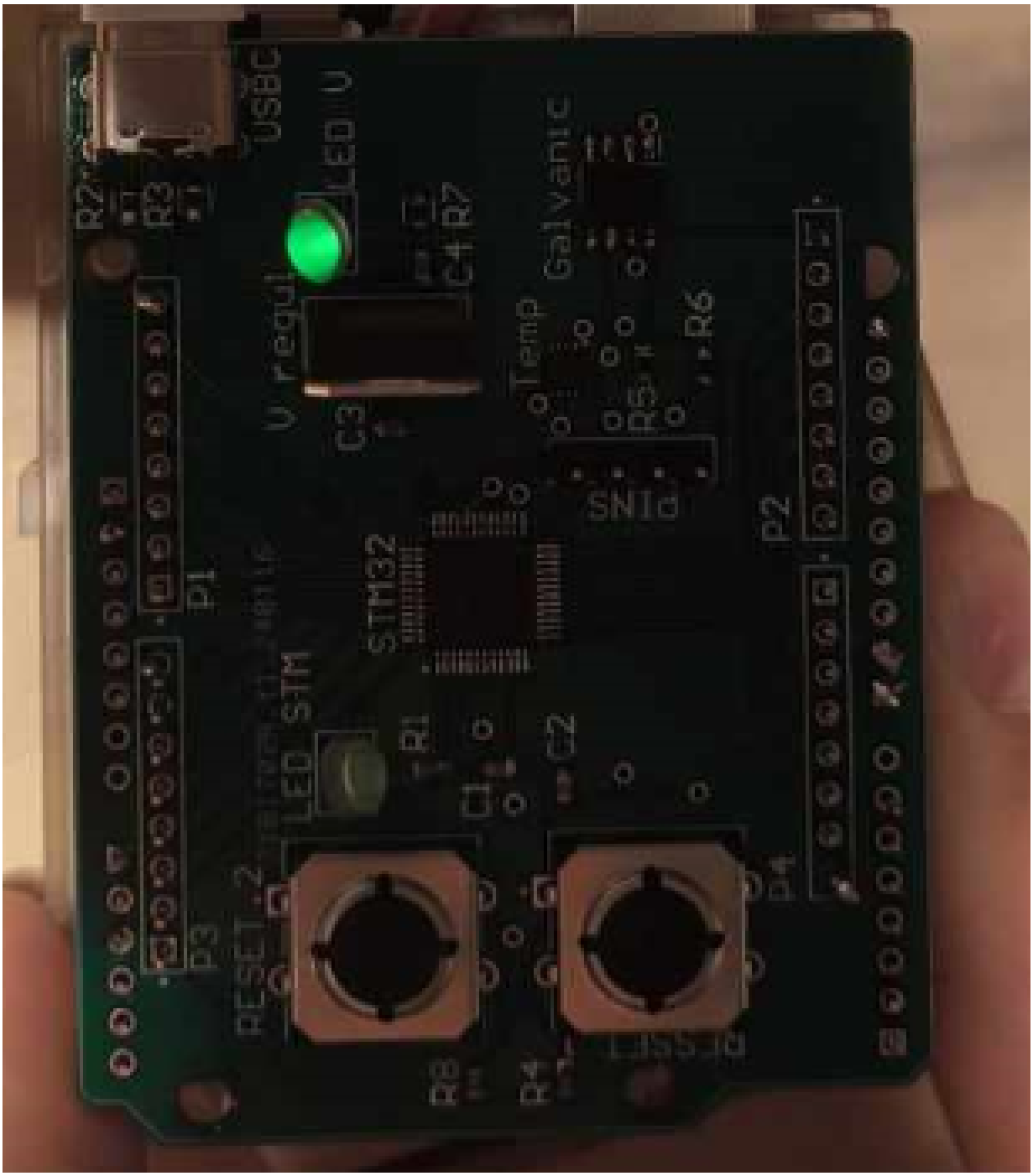
R6
P4
P2

5 3D Model


USBC
R2
R3
R7
Galvanic
Temp
R6
R5
C3
SNId
P1
P2
STM32
LED STM
R1
C1
C2
P3
P4
RESET.2
RESET
R8
R4

6 PCB after assembly



7 Summary

The process of creating the microcontroller board proved to be a very enjoyable and interesting experience. Working with Altium, although challenging, provided valuable insights and knowledge. The project, although time consuming, was a rewarding endeavour.

I received the board on Thursday. I managed to assemble it on Friday and Saturday. I soldered most of it in the lab under a microscope and with a thin soldering iron and some of the larger components at home.

The project was not only a learning opportunity, but also a good experience in troubleshooting and adapting to unexpected circumstances. Despite the challenges, the overall experience was rewarding, making it a very enjoyable and interesting project.