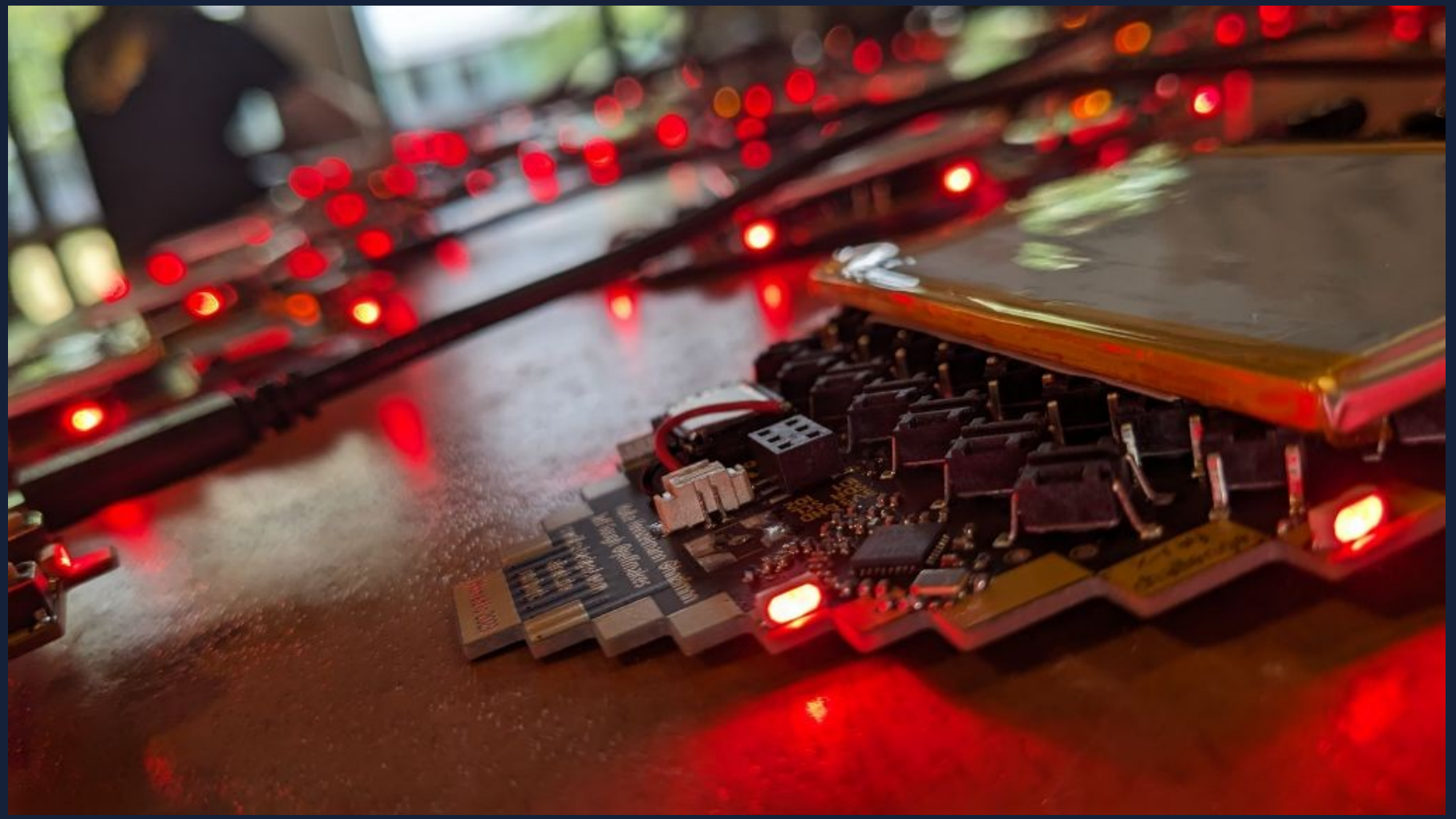
TROOPERS23 Badge - A RETROspective

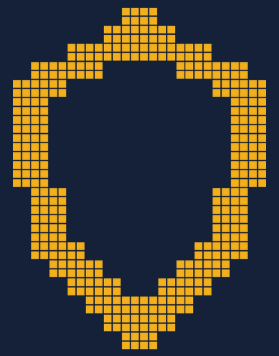


A Typical Timeline of a TROOPERS Badge

First meeting

TROOPERS

~ December



A Typical Timeline of a TROOPERS Badge

A Typical Timeline of a TROOPERS Badge

First meeting

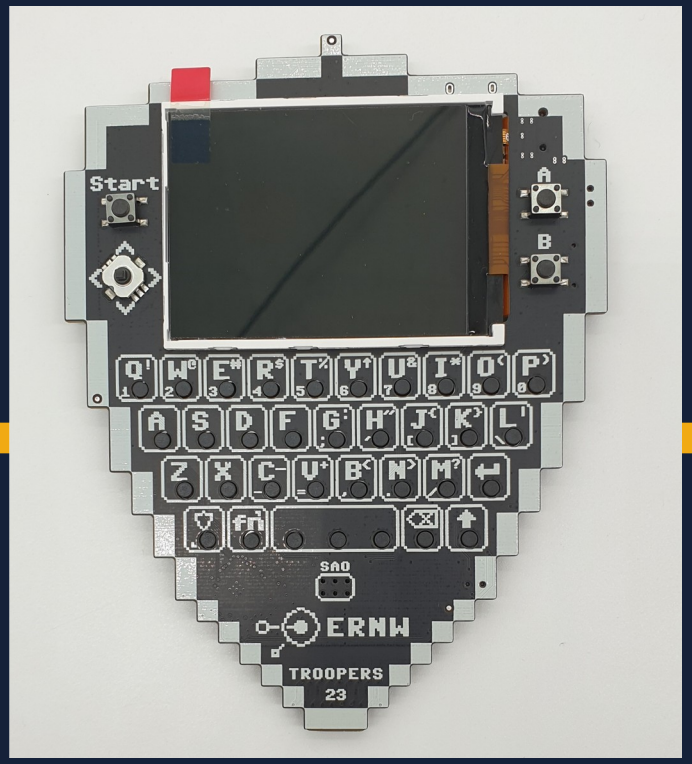
~ December

We have a schematic

~March

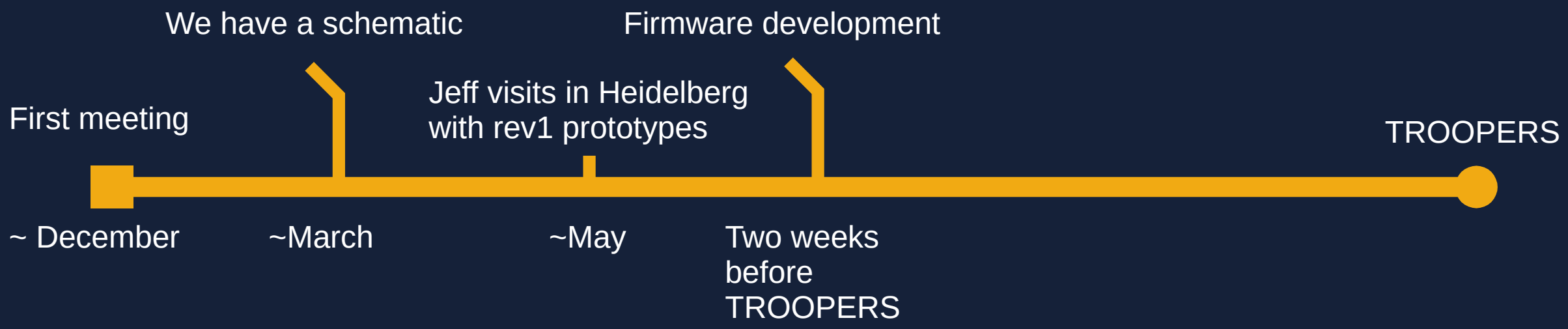
Jeff visits in Heidelberg with rev1 prototypes

~May

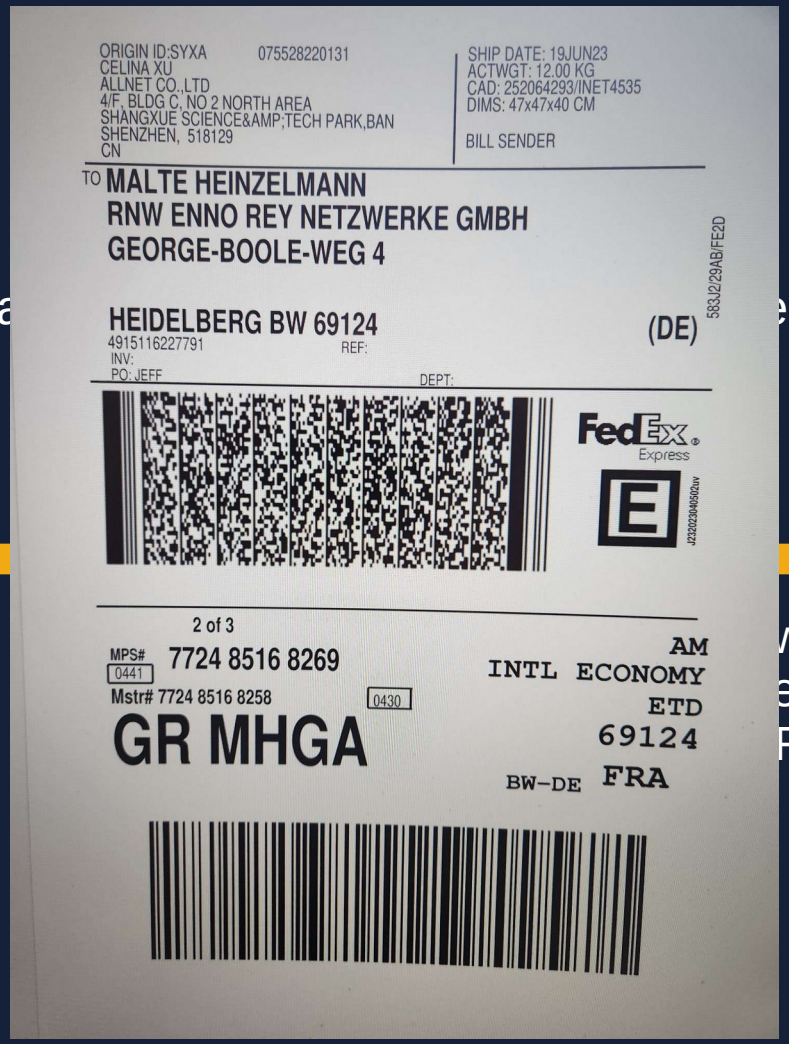


TROOPERS

A Typical Timeline of a TROOPERS Badge



A Typical Timeline of a TROOPERS Badge



We ha e development

First meeting

~ December

wo weeks efore ROOPERS

Badges assembled, tested, shipped

Last week

TROOPERS

A Typical Timeline of a TROOPERS Badge

We ha… …e development

First meeting

~ December

Badges assembled, tested, shipped

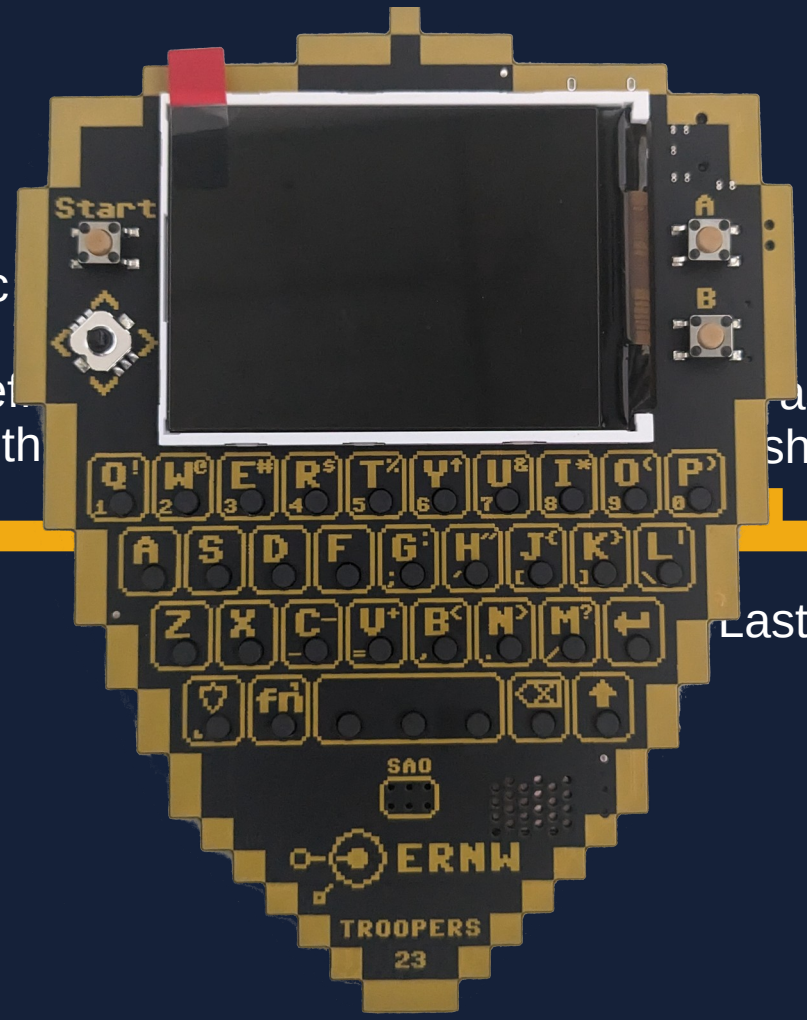
…ks

Last week

TROOPERS

…RS

A Typical Timeline of a TROOPERS Badge



First meeting

~ December

We have a schematic

~March

Jef
with

assembled,
shipped

Last week

Badges arrive

Friday before
TROOPERS

TROOPERS

TROOPERS23

ERNW

A Typical Timeline of a TROOPERS Badge

F

~

dges arrive

ed,

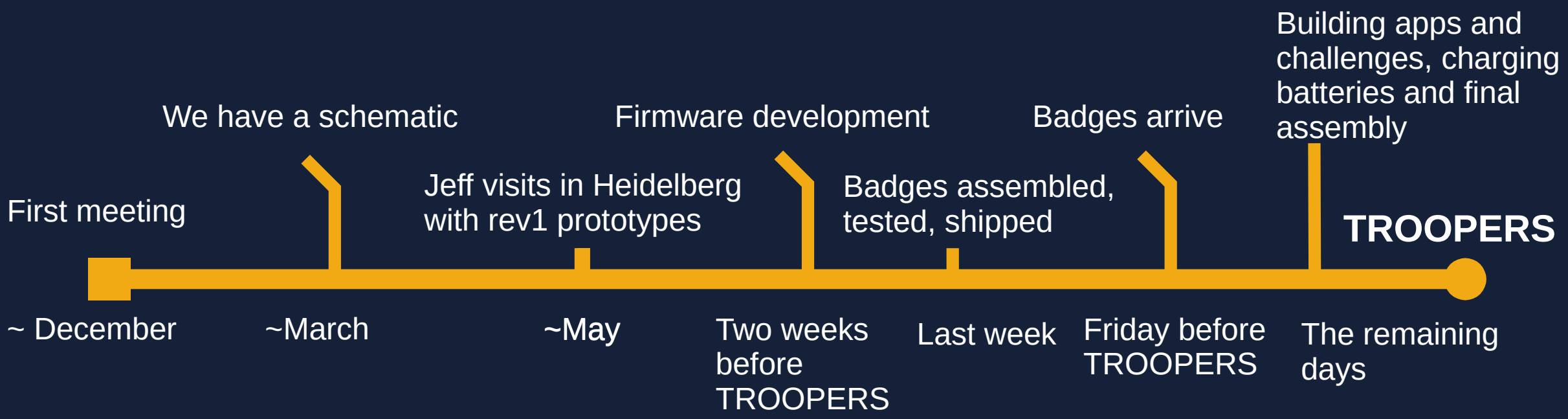
Building apps and challenges, charging batteries and final assembly

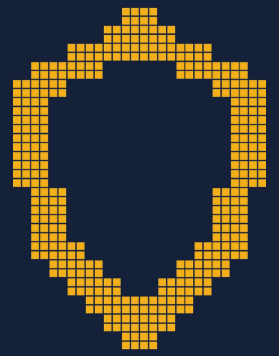
TROOPERS

Friday before TROOPERS

The remaining days

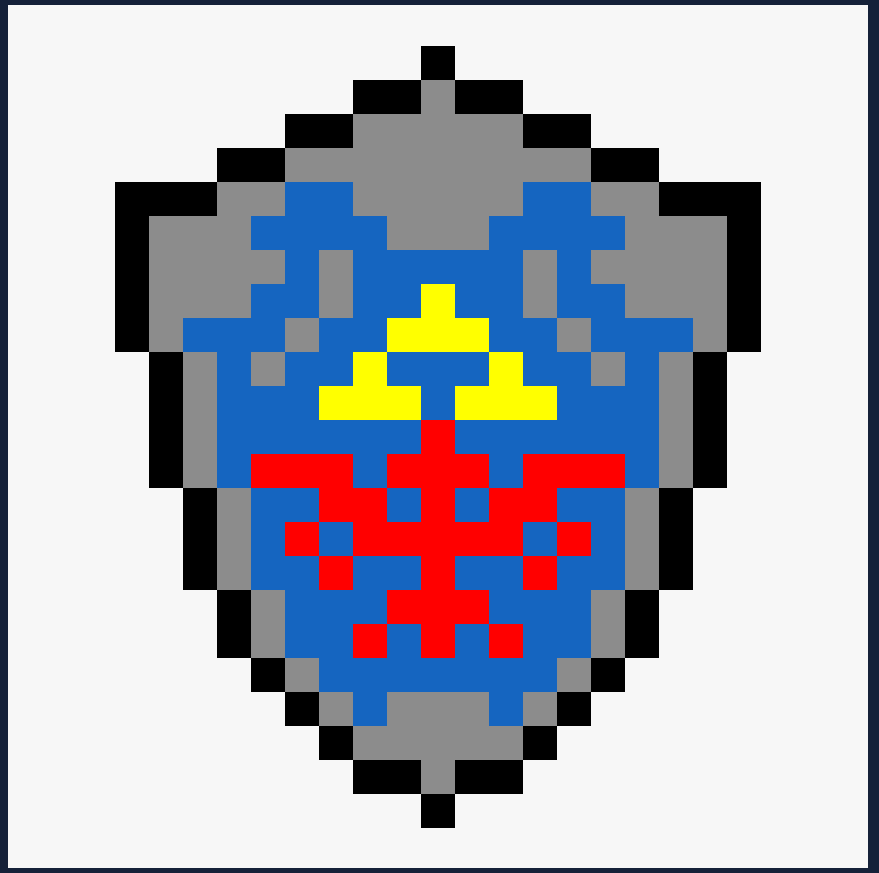
A Typical Timeline of a TROOPERS Badge



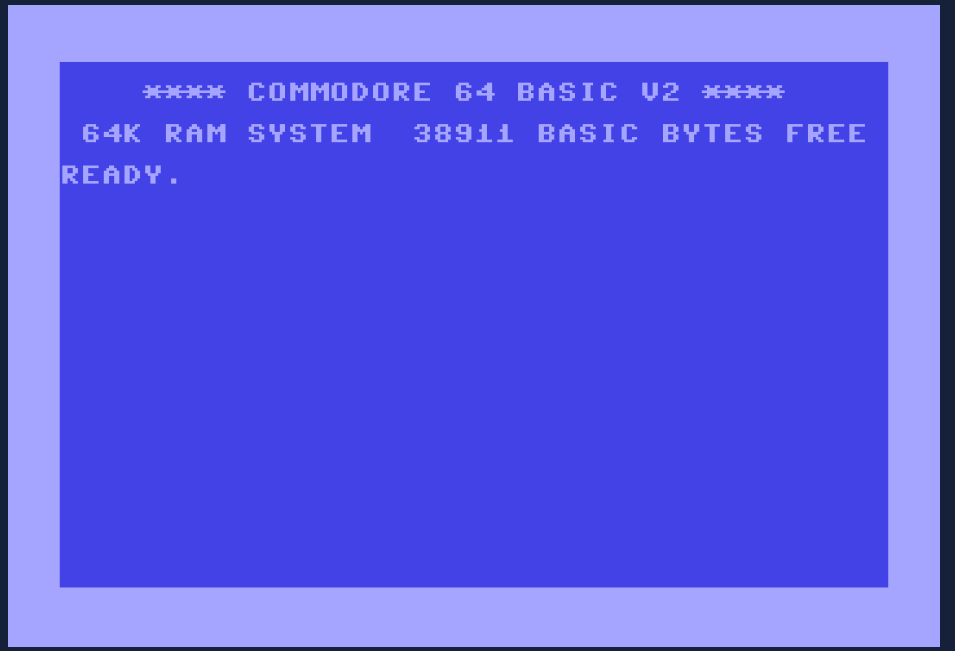


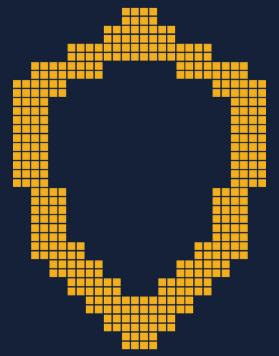
Concept Phase

- You found an artifact in a retro adventure game



Design references



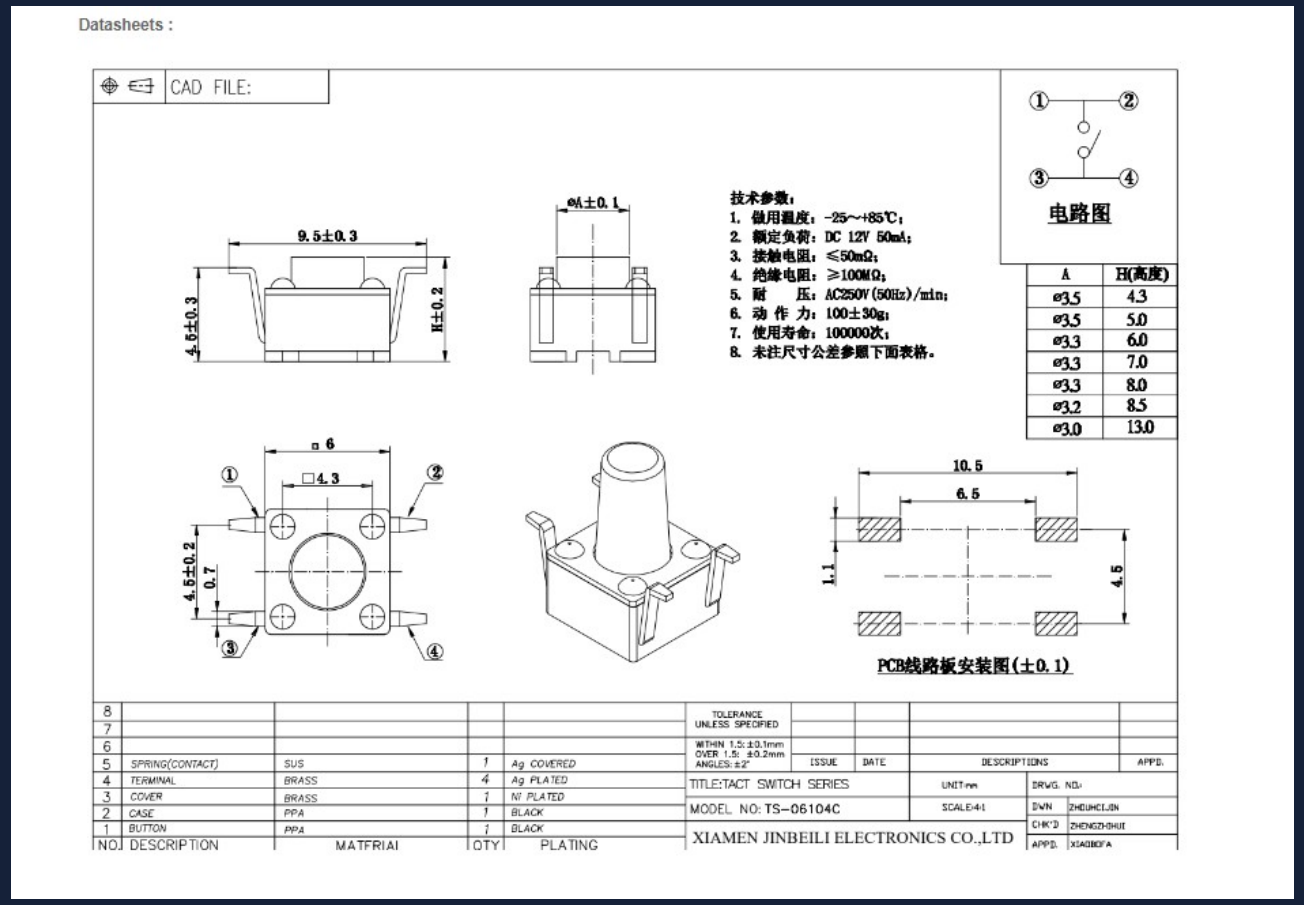


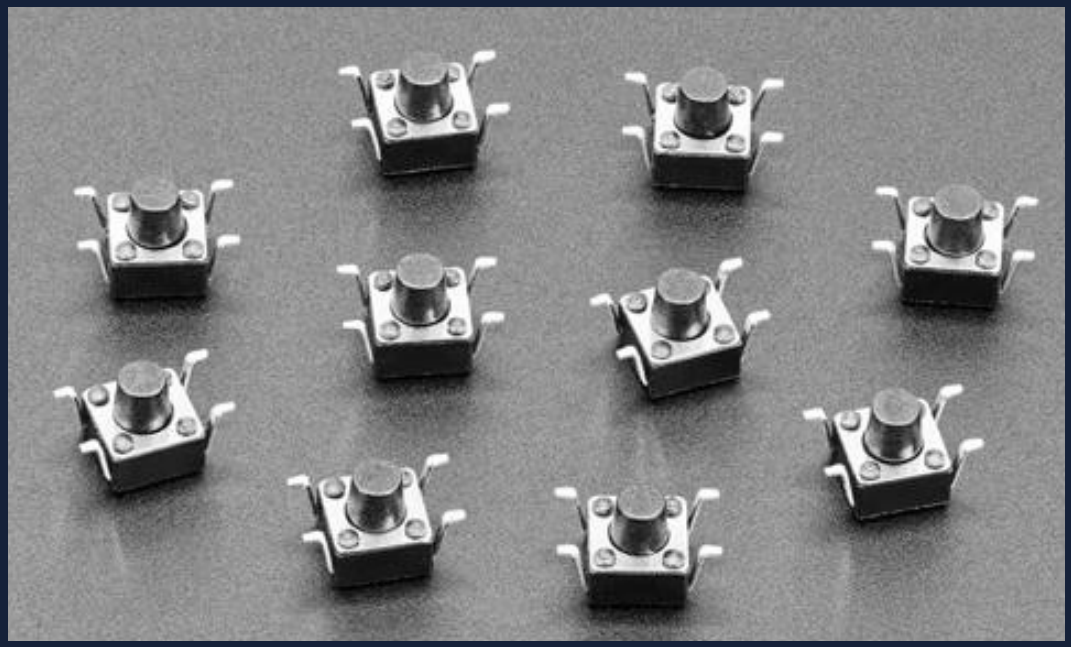
Hardware Design

- Kept similar hardware platform
- Adopting the theme into the design
- And then there is my obsession with level of detail

Hardware Design - The Spark of an Idea

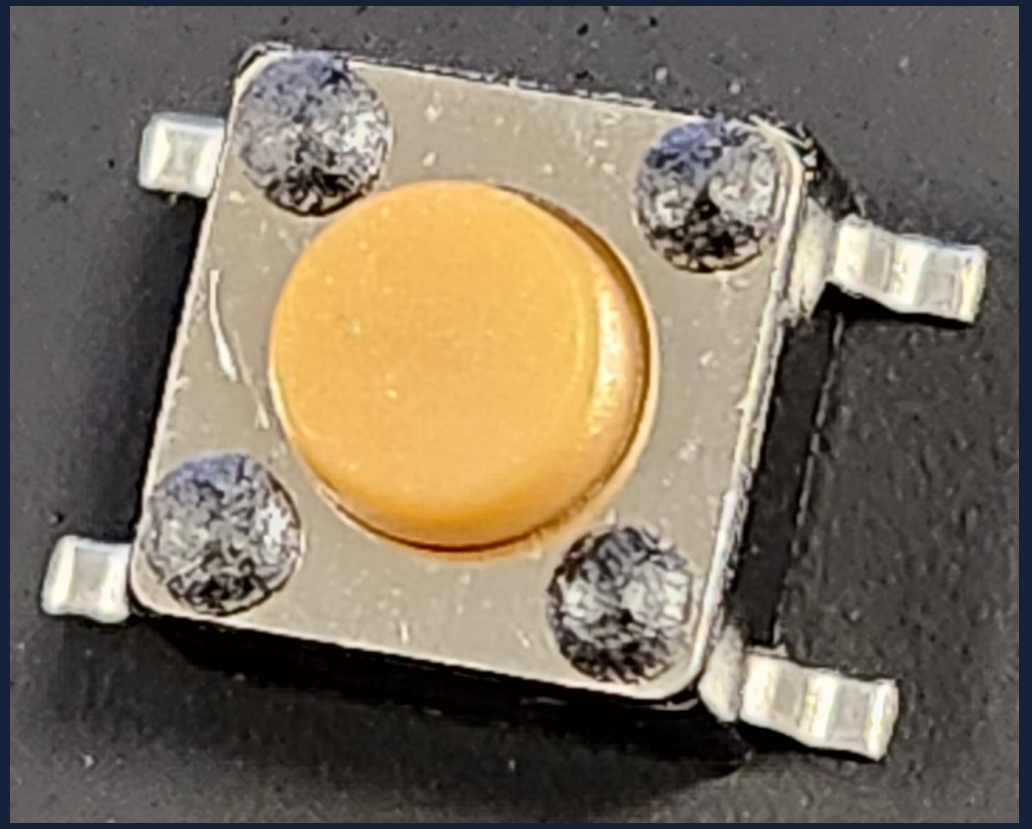
Datasheets :



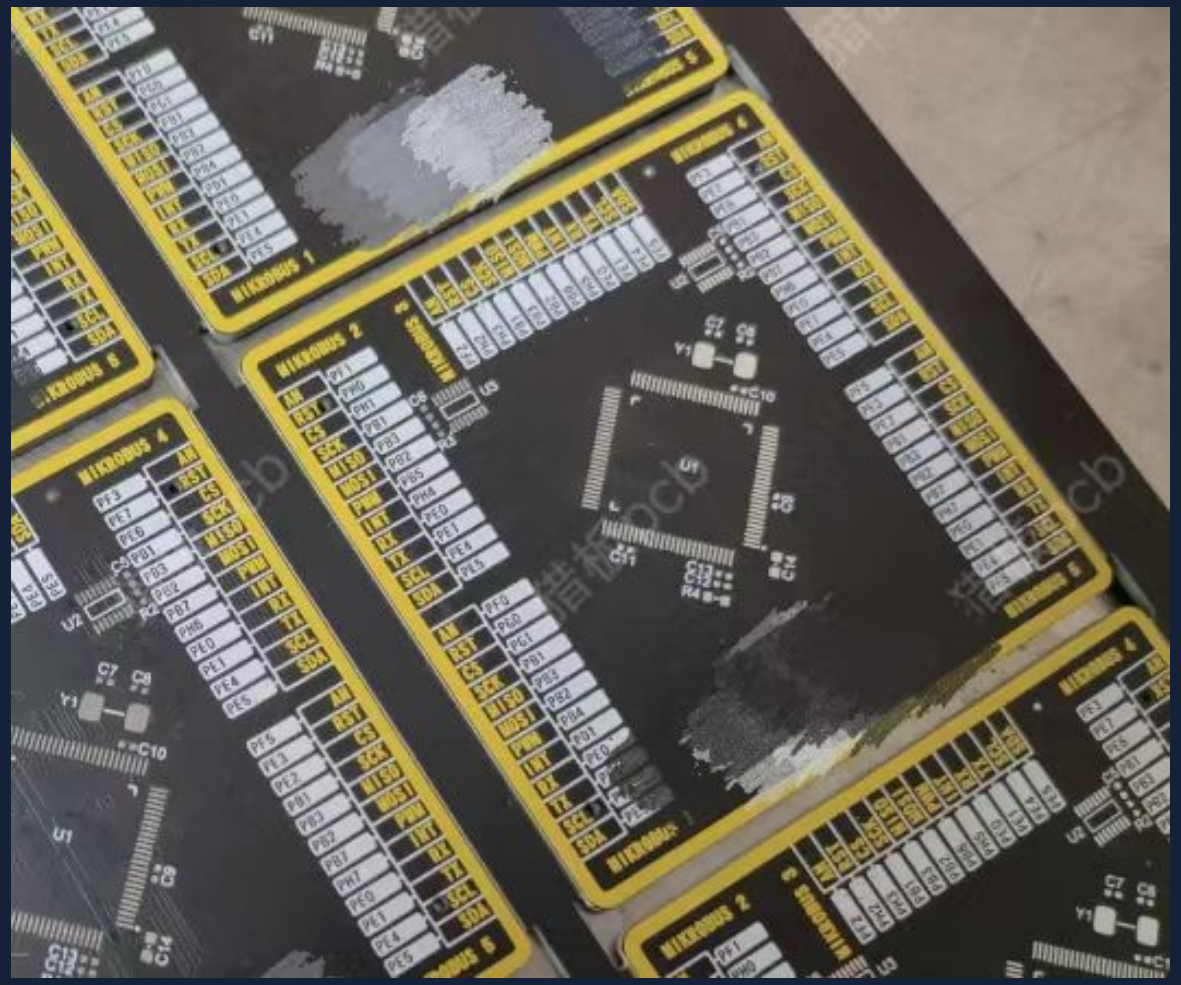


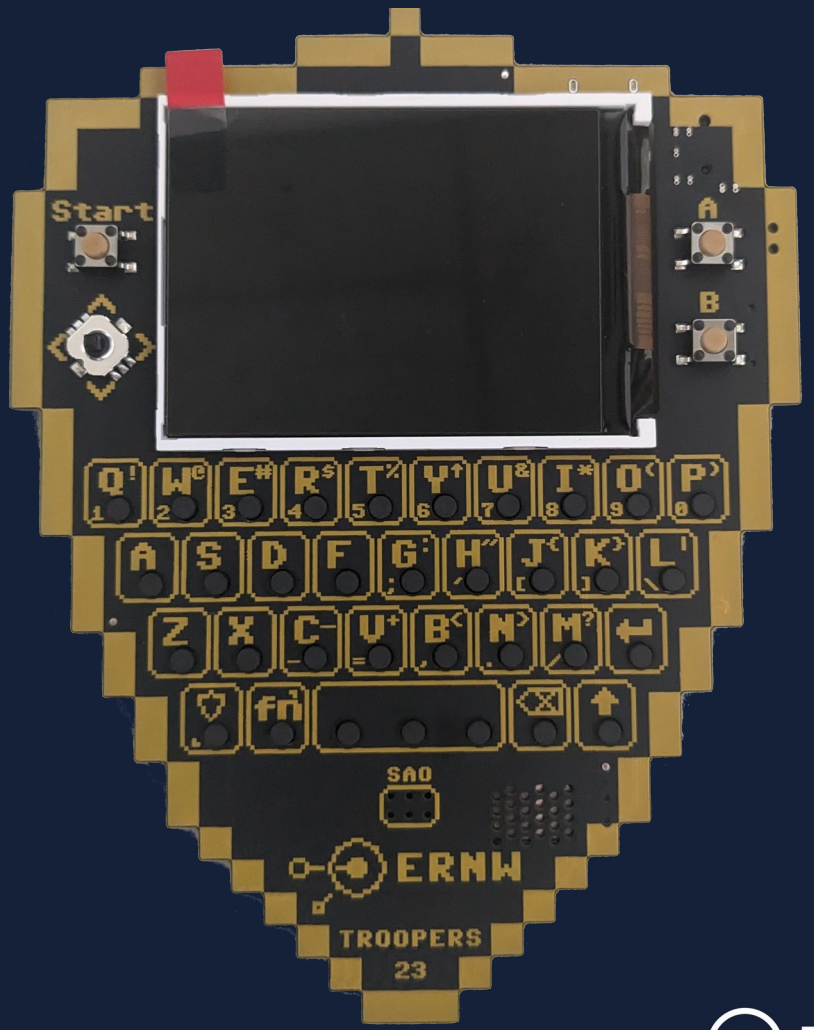
Hardware Design - Revision 0

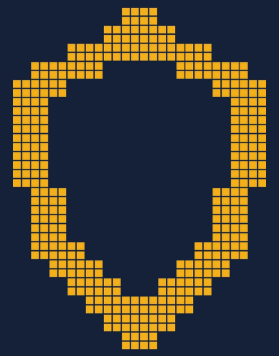
Hardware Design - The Details Matter!



Hardware Design - The Details Matter!

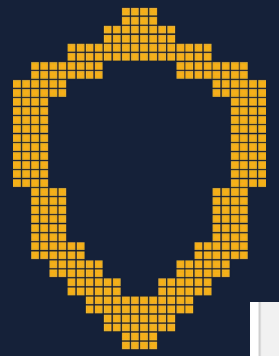






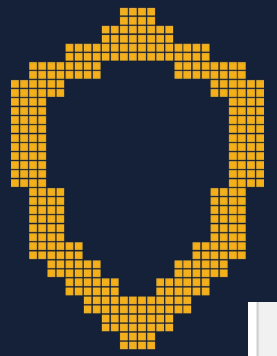
British Empire and German customs

Tuesday, June 20, 2023		Location	Time	Pieces
6	Shipment has departed from a DHL facility EAST MIDLANDS - UK	EAST MIDLANDS - UK	22:59	1 Pieces



British Empire and German customs

Sunday, June 25, 2023		Location
12	Clearance Event	LEIPZIG - GERMANY
Saturday, June 24, 2023		**Location**
11	Clearance Event	LEIPZIG - GERMANY
Thursday, June 22, 2023		**Location**
10	Clearance Event	LEIPZIG - GERMANY
Wednesday, June 21, 2023		**Location**
9	Clearance Event	LEIPZIG - GERMANY
8	Processed for clearance at LEIPZIG - GERMANY	LEIPZIG - GERMANY
7	Arrived at DHL Sort Facility LEIPZIG - GERMANY	LEIPZIG - GERMANY



British Empire and German customs

Sunday, June 25, 2023	
12	Clearance Event
Saturday, June 24, 2023	
11	Clearance Event
Thursday, June 22, 2023	
10	Clearance Event
Wednesday, June 21, 2023	
9	Clearance Event
8	Processed for clearance at LEIPZIG - GERMANY
7	Arrived at DHL Sort Facility LEIPZIG - GERMANY

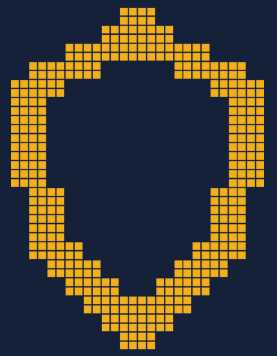
Monday, June 26, 2023		Location
18	Processed at LEIPZIG - GERMANY	LEIPZIG - GERMANY
17	Customs clearance status updated. Note - The Customs clearance process may start while the shipment is in transit to the destination.	LEIPZIG - GERMANY
16	Customs clearance status updated. Note - The Customs clearance process may start while the shipment is in transit to the destination.	LEIPZIG - GERMANY
15	Customs clearance status updated. Note - The Customs clearance process may start while the shipment is in transit to the destination.	LEIPZIG - GERMANY
14	Clearance Event	LEIPZIG - GERMANY
13	Clearance Event	LEIPZIG - GERMANY

British Empire and German customs

Sunday, June 25, 2023		
12	Clearance Event	
Saturday, June 24, 2023		
11	Clearance Event	
Thursday, June 22, 2023		
10	Clearance Event	
Wednesday, June 21, 2023		
9	Clearance Event	
8	Processed for clearance at LEIPZIG - GERMANY	
7	Arrived at DHL Sort Facility LEIPZIG - GERMANY	
Monday, June 26, 2023		
18	Processed at LEIPZIG - GERMANY	
17	Customs clearance status updated. Note - The Customs clearance process may start while the shipment is in transit to the destination.	
16	Customs clearance status updated. Note - The Customs clearance process may start while the shipment is in transit to the destination.	
15	Customs clearance status updated. Note - The Customs clearance process may start while the shipment is in transit to the destination.	
14	Clearance Event	
13	Clearance Event	
25	Arrived at DHL Delivery Facility MANNHEIM - GERMANY	MANNHEIM - GERMANY
24	Shipment has departed from a DHL facility FRANKFURT - GERMANY	FRANKFURT - GERMANY
23	Processed at FRANKFURT - GERMANY	FRANKFURT - GERMANY
22	Clearance processing complete at FRANKFURT - GERMANY	FRANKFURT - GERMANY
21	Arrived at DHL Sort Facility FRANKFURT - GERMANY	FRANKFURT - GERMANY
20	Customs clearance status updated. Note - The Customs clearance process may start while the shipment is in transit to the destination.	FRANKFURT - GERMANY
19	Shipment has departed from a DHL facility LEIPZIG - GERMANY	LEIPZIG - GERMANY

British Empire and German customs

Sunday, June 25, 2023		
12	Clearance Event 5	
Saturday, June 24, 2023		
11	Clearance Event 4	
Thursday, June 22, 2023		
10	Clearance Event 3	
Wednesday, June 21, 2023		
9	Clearance Event 2	
8	Processed for clearance at LEIPZIG - GERMANY 1	
7	Arrived at DHL Sort Facility LEIPZIG - GERMANY	
Monday, June 26, 2023		
18	Processed at LEIPZIG - GERMANY	
17	Customs clearance status updated. Note - The Customs clearance process may start while the shipment is in transit to the destination. 10	
16	Customs clearance status updated. Note - The Customs clearance process may start while the shipment is in transit to the destination. 9	
15	Customs clearance status updated. Note - The Customs clearance process may start while the shipment is in transit to the destination. 8	
14	Clearance Event 7	
13	Clearance Event 6	
25	Arrived at DHL Delivery Facility MANNHEIM - GERMANY	MANNHEIM - GERMANY
24	Shipment has departed from a DHL facility FRANKFURT - GERMANY	FRANKFURT - GERMANY
23	Processed at FRANKFURT - GERMANY	FRANKFURT - GERMANY
22	Clearance processing complete at FRANKFURT - GERMANY 12	FRANKFURT - GERMANY
21	Arrived at DHL Sort Facility FRANKFURT - GERMANY	FRANKFURT - GERMANY
20	Customs clearance status updated. Note - The Customs clearance process may start while the shipment is in transit to the destination. 11	FRANKFURT - GERMANY
19	Shipment has departed from a DHL facility LEIPZIG - GERMANY	LEIPZIG - GERMANY



British Empire and German customs

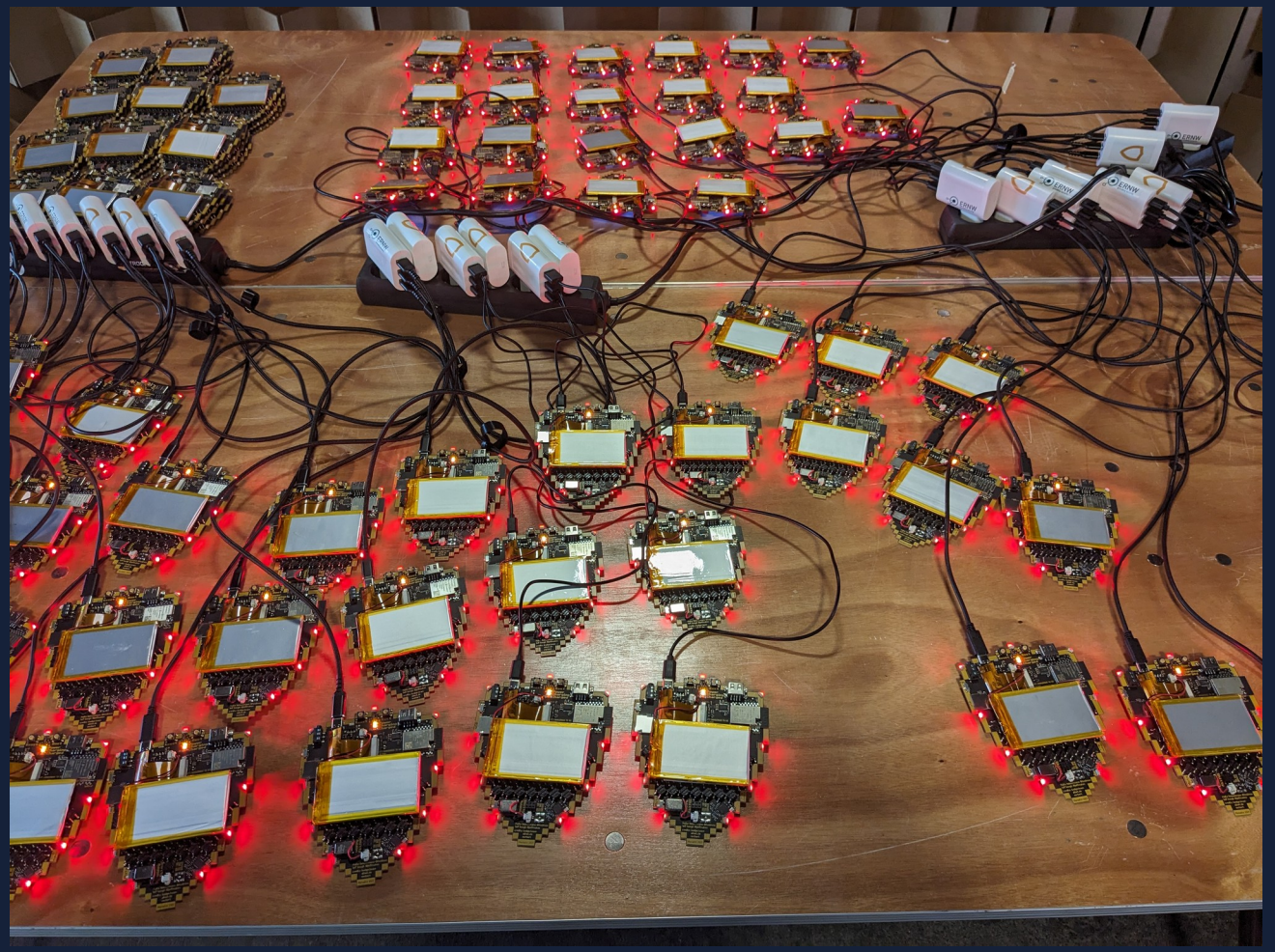
Tuesday, June 27, 2023		Location	Time
28	Delivered	MANNHEIM - GERMANY	10:52

Well, kinda…

We actually didn't trust them anymore so we picked it up in Mannheim

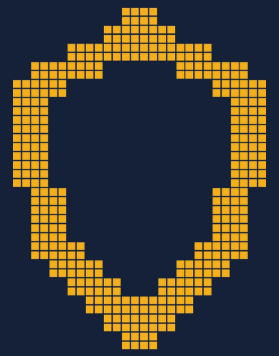
Monday: (Almost) Everything Arrived

- We had:
  - Badges
  - Batteries
  - SAO PCBs
  - Most SAO components
- Still missing:
  - Tape for the batteries
  - Connectors for the controller
- Let’s start charging



Tuesday: (Almost) Everything Arrived

- Emergency tape no good
  - Batteries falling off
  - Let’s redo gluing all 350 batteries!
- Finally, let’s get flashing



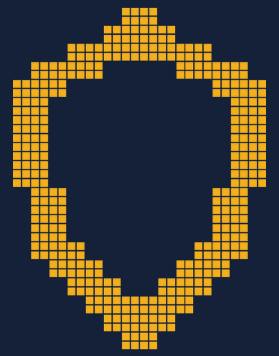
Building the firmware

- Shoutouts to the whole team behind the badge.team firmware
- Especially Renze Nicolai (https://renzenicolai.nl/)
- New base firmware/launcher
  - Boot any ESP32 binaries
  - Python as an app (not fully working (for now))
- Combine with new drivers for TROOPERS hardware
- Everything is open-source
  - https://github.com/badgeteam/troopers-2023-firmware/

Building the firmware

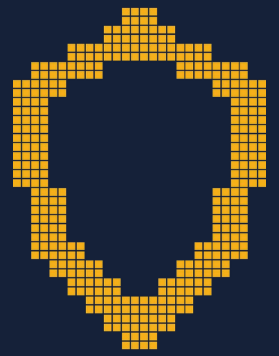
- Weird issues when activating WiFi

  - Fixable by keeping the ADC on all the time



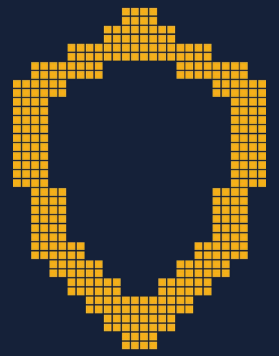
Using the badge at home

- There will also be a blog post shortly on https://insinuator.net/ containing useful links for using and modifying your badge at home
- In the meantime check out:
  - https://github.com/badgeteam/troopers-2023-firmware
  - https://github.com/jeffmakes/tr23-badge-hw
  - https://badge.team/docs/
  - https://github.com/jeffmakes/tr23-sao-hw
  - https://www.youtube.com/watch?v=P_sS03nvGE8 (SAO soldering instructions)



Thank you!

- Flo and Micele for giving us no boundaries on the creative part
- Badge.team, especially Renze
- All ERNW crew that helped us with:
  - Soldering rework for the batch of prototypes
  - Taping the batteries (twice!)
  - Charging
  - Writing a challenge app
  - Flashing the firmware and burning fuses
  - Driving to Mannheim to pick up the package



Question?

- Feel free to ask us any question or give feedback now or later when you see us around
- We’re also reachable via Twitter
  - Jeff: **@jeffmakes**
  - Malte: **@hnzlmnn**