THE GARDEN | BLIND FLIGHT | WHAT THE BOX SAW

From my Garden to the **Stratosphere**

How I nearly lost a GPU at 37 km

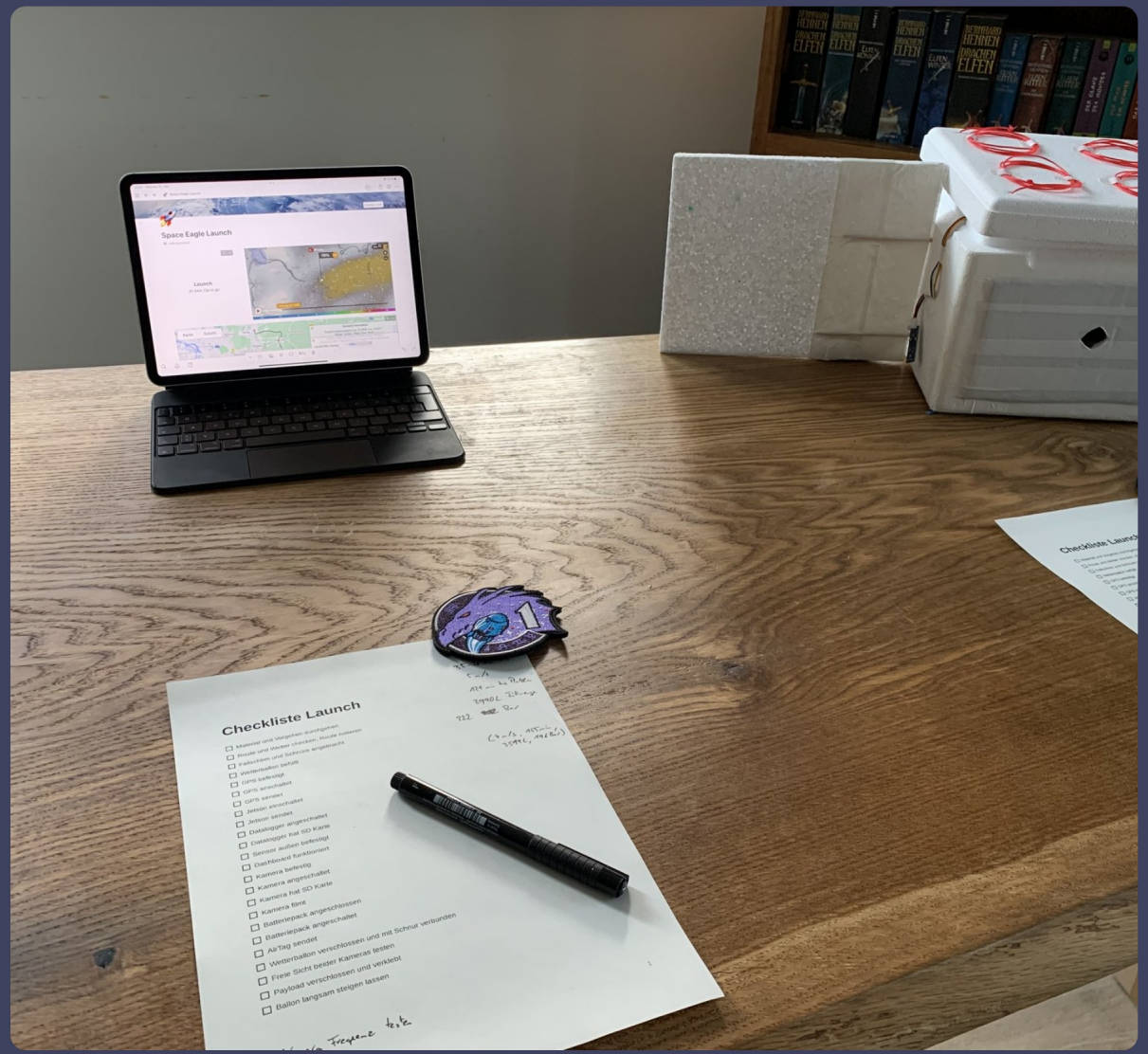


Matthias Lau · code.talks 2026



THE GARDEN





07:05 Briefing

07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00

THE GARDEN





09:47

Briefing

07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00


THE GARDEN
10:25 Launch
Briefing
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00


THE GARDEN
The neighbours' balcony
10:25 Launch
Briefing
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00

THE GARDEN

Space Eagle 🚀🎈

CONNECTION Ok · POSITION Ok · FEDERATED LEARNING No Connection · JUPYTER No Connection



Outside Temp
15.8
°C

Cabin Temp
24.9
°C

Altitude
60
m

Vertical Speed
-4.2
m/s

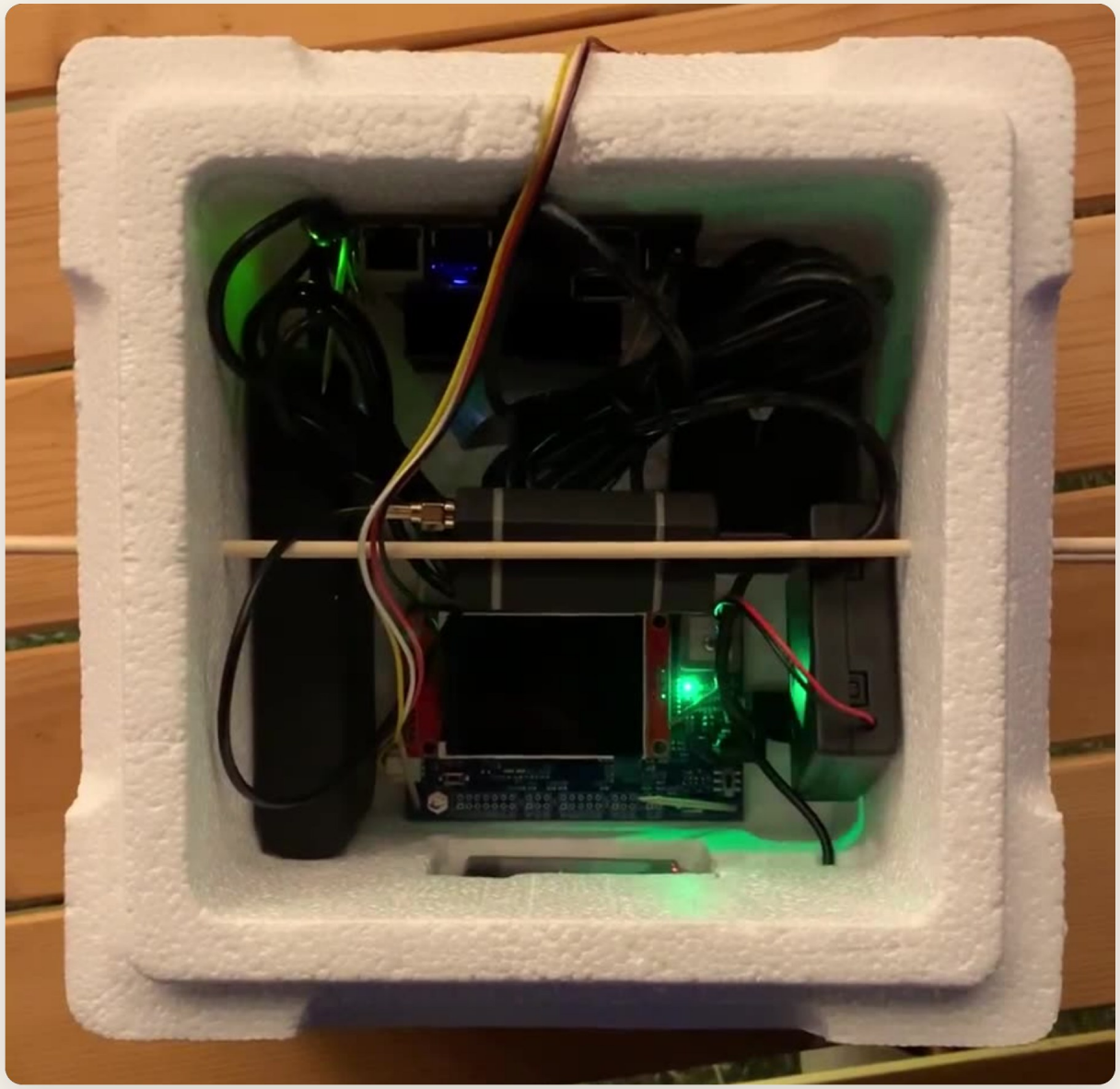
Speed over Ground	17 km/h	Humidity	55.4 %
Pressure	1023.4 hPa	UVA Index	0.46
CPU Temp	30.0 °C	GPU Temp	30.0 °C
Battery	5.07 V	Battery Datalogger	4.96 V

10:25 Launch

Briefing

07:00 · 08:00 · 09:00 · 10:00 · 11:00 · 12:00 · 13:00 · 14:00 · 15:00

BLIND FLIGHT FLASHBACK · MONTHS BEFORE



Action cam horizon

Second camera looking down

Datalogger sensors inside and outside

GPS tracker with SIM card

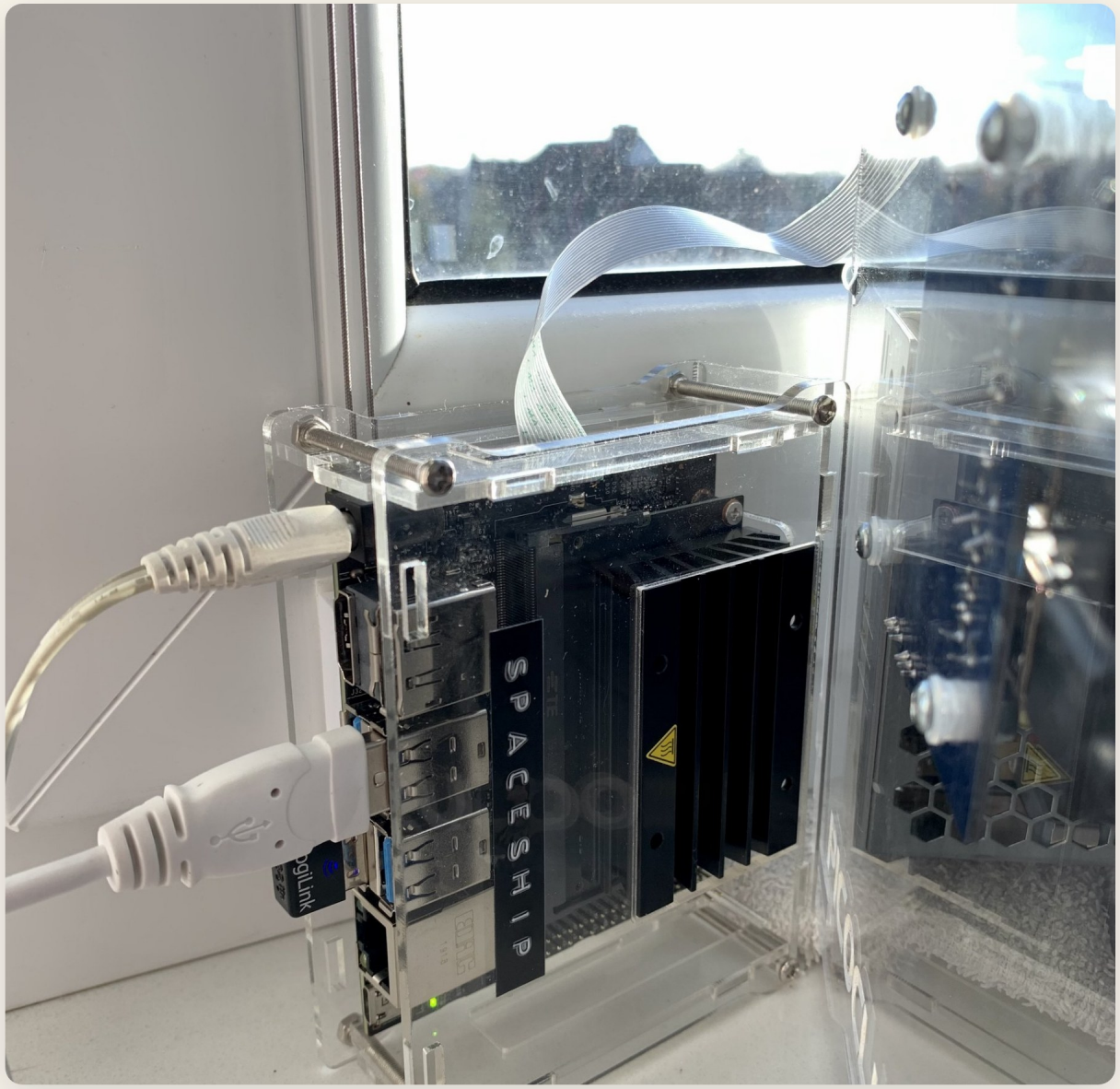
NVIDIA Jetson Nano

Power bank

LoRa radio

AirTag

BLIND FLIGHT FLASHBACK · MONTHS BEFORE



Onboard **machine learning**

optional: federated learning

Three pieces of software

Spaceship
on the Jetson, in the box

LoRa · IP

Houston
ground station

WebSocket

Flight Control
dashboard

BLIND FLIGHT FLASHBACK · MONTHS BEFORE

It has to heal itself

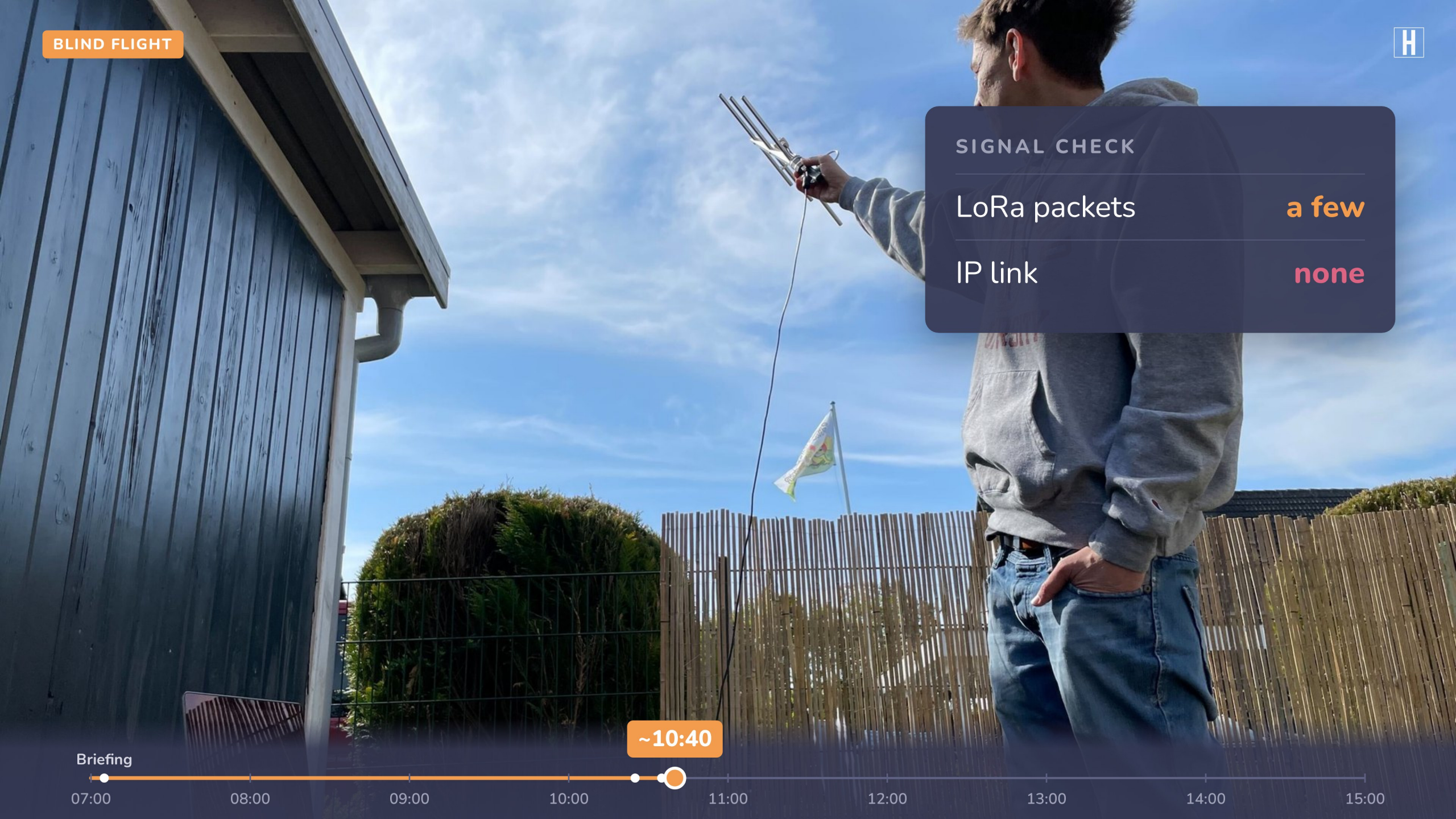
WATCHDOG

Any error → **restart everything**

spaceship running

WHAT IT SENDS

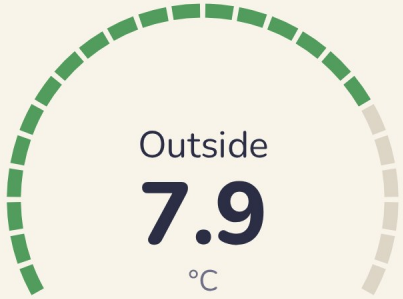
Good link	metrics + images
Slow link	metrics only
No link	record locally
Low power	camera off


BLIND FLIGHT
SIGNAL CHECK
LoRa packets
a few
IP link
none
~10:40
Briefing
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00

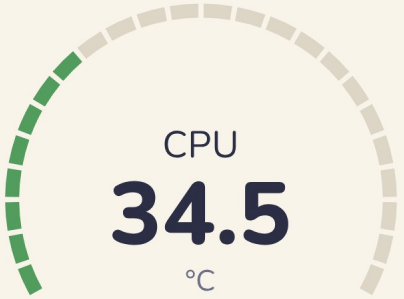

BLIND FLIGHT
~11:20
Briefing
Launch
Signal lost
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00

Too cold? Or too warm?

Terrace



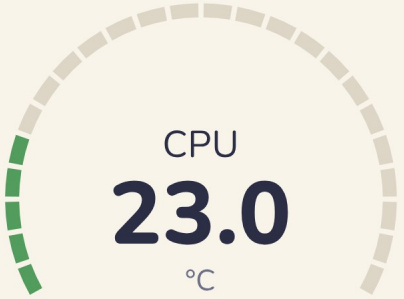




Freezer







Is this allowed? Yes, with a permit.

TO APPLY

Permit
aviation authority, 50 €

Landowner
consent

City
“no objections”

Insurance
liability

ON LAUNCH DAY

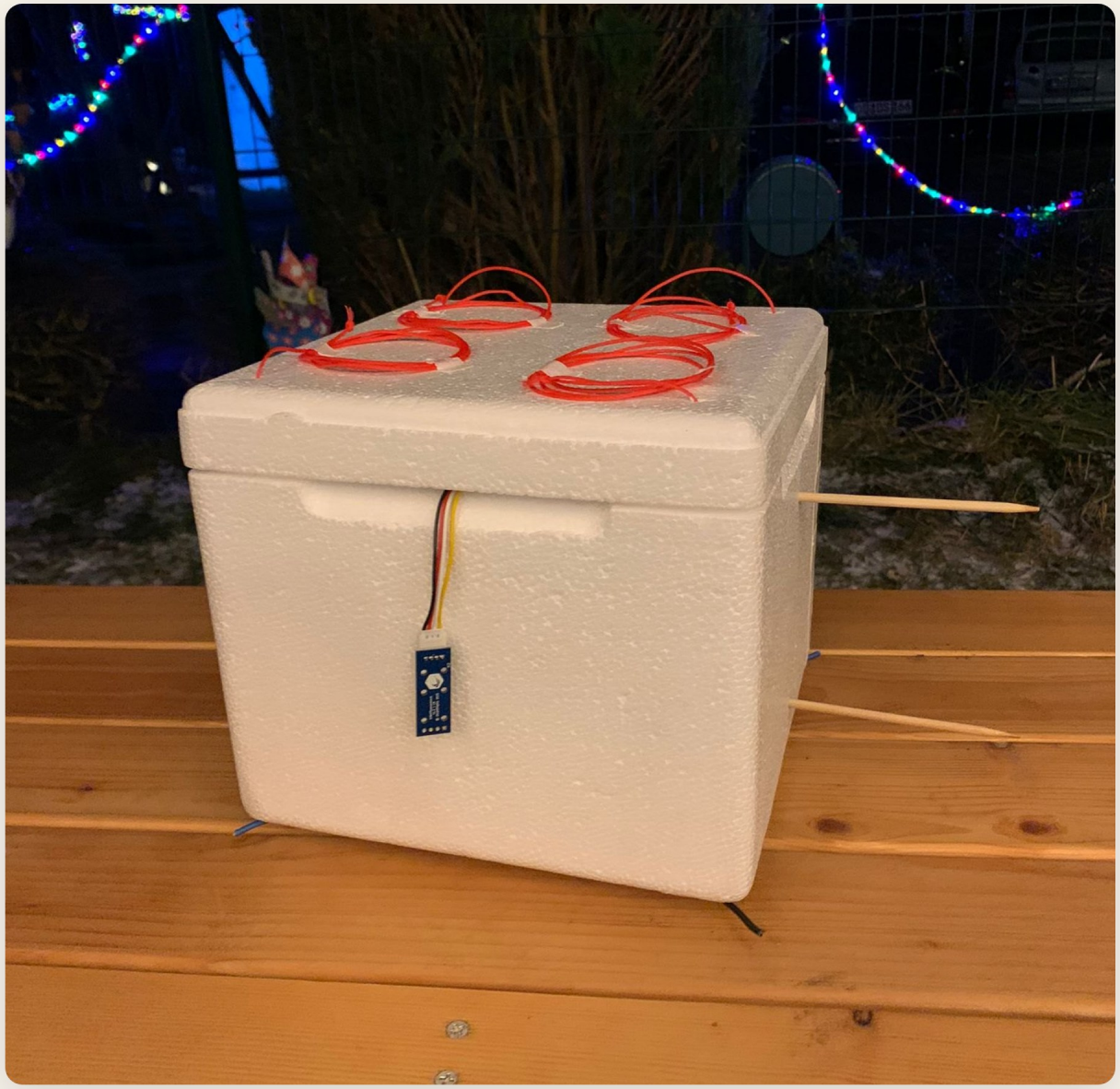
Parachute
for the descent

GPS log
kept 6 months

Contact details
on the box

Visibility ≥ 5 km
clouds ≤ 4/8

Never into Hamburg's control zone



ATTEMPT 1

Clouds. Cancelled.



ATTEMPT 2

Control zone.
Cancelled.

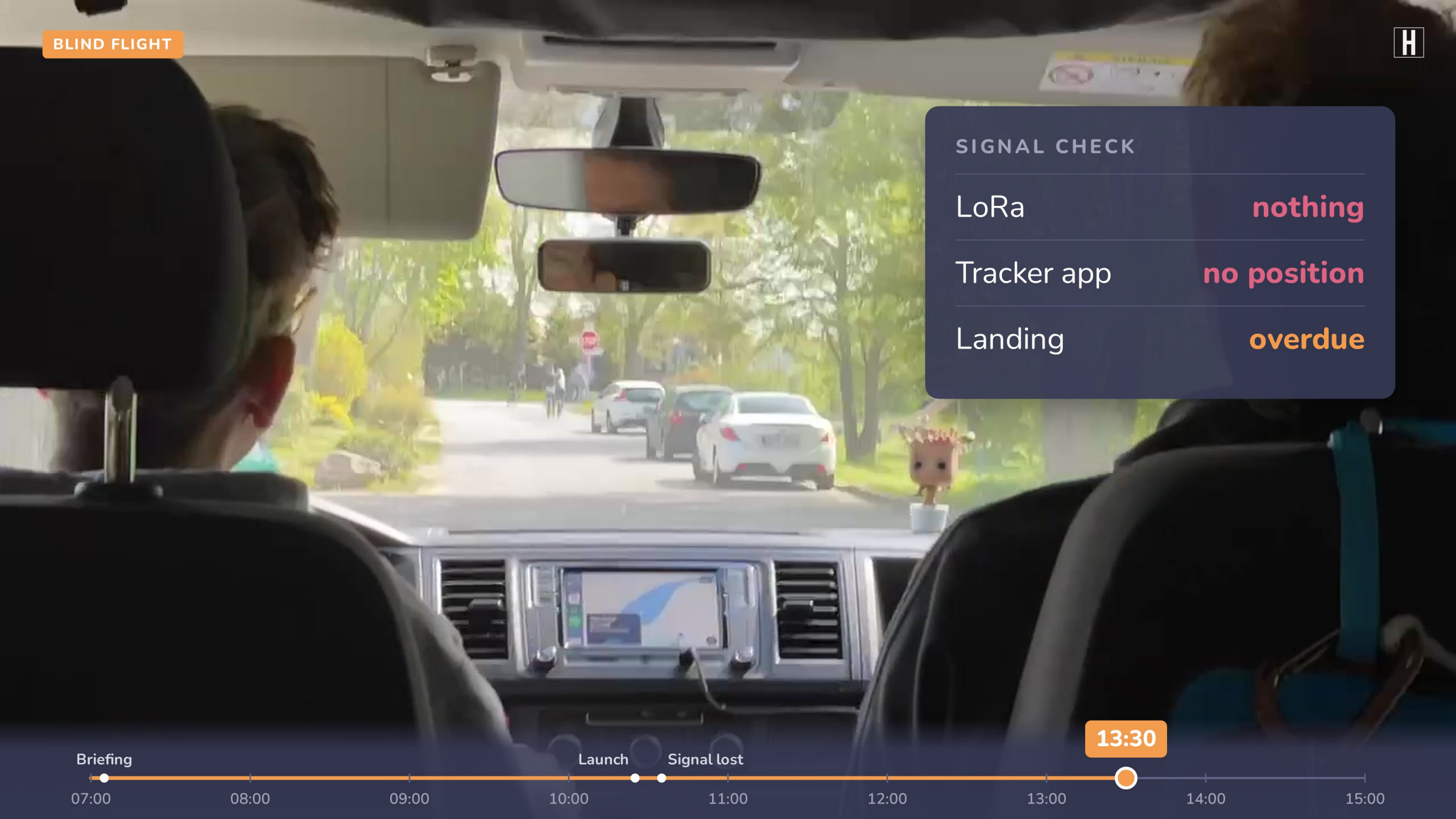
DAY BEFORE LAUNCH · 10:27

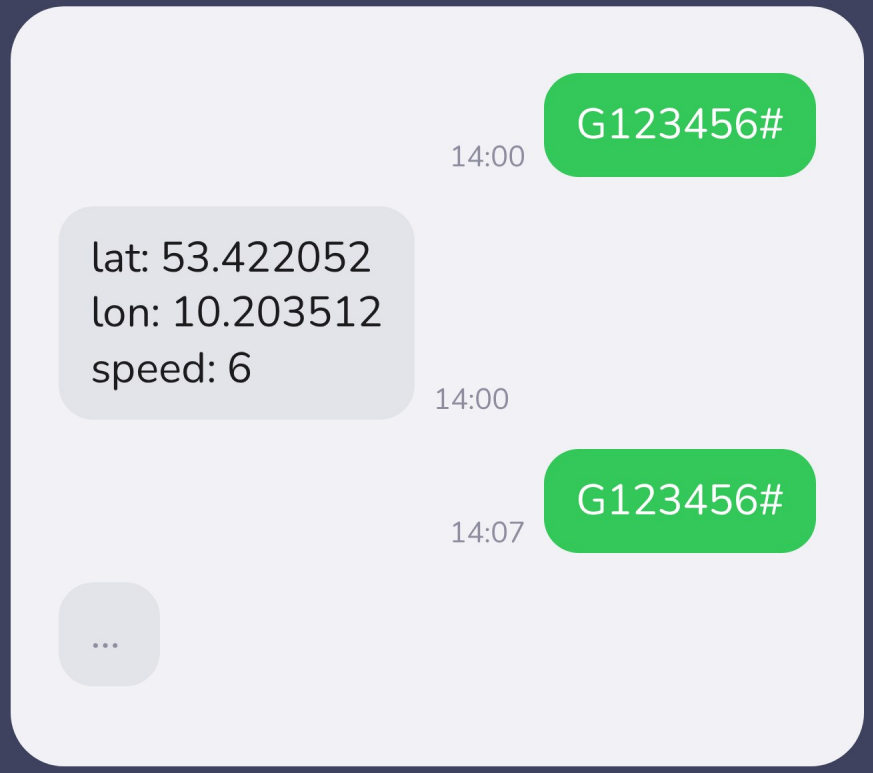
OpenWeather: **100 %** clouds

Kachelmann: **75 %**

Windy: **71 %**

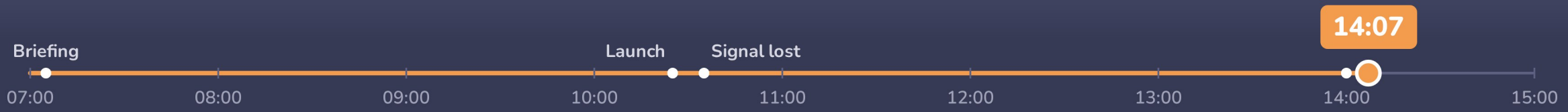
Looking outside: **blue sky**


BLIND FLIGHT
SIGNAL CHECK
LoRa
nothing
Tracker app
no position
Landing
overdue
13:30
Briefing
Launch
Signal lost
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00



PLAN B

Ask the tracker **by SMS**

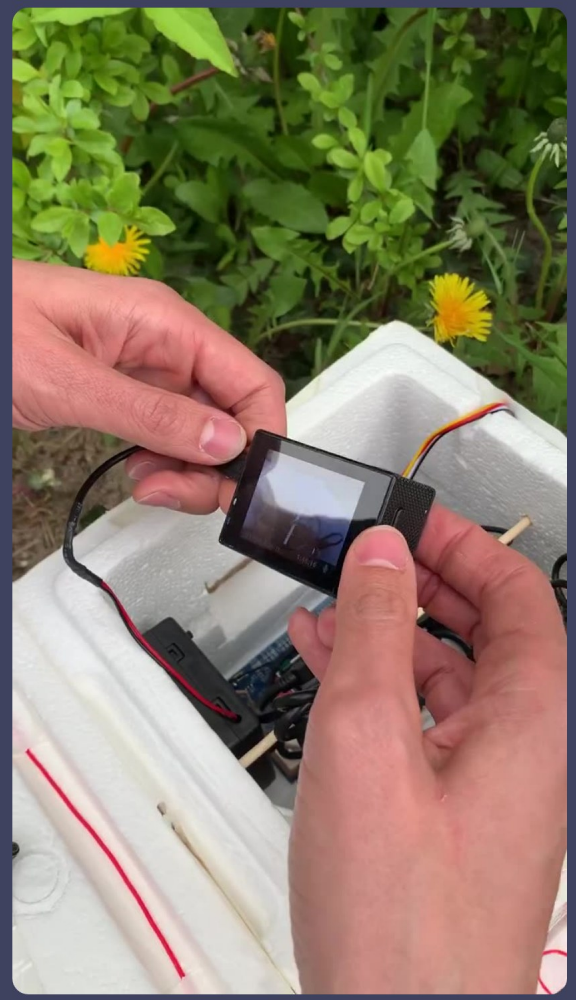



BLIND FLIGHT
TDI
SURFERVAN
Found by the AirTag · 14 km from the garden
Briefing
Launch
Signal lost
SMS
14:33 Found
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00

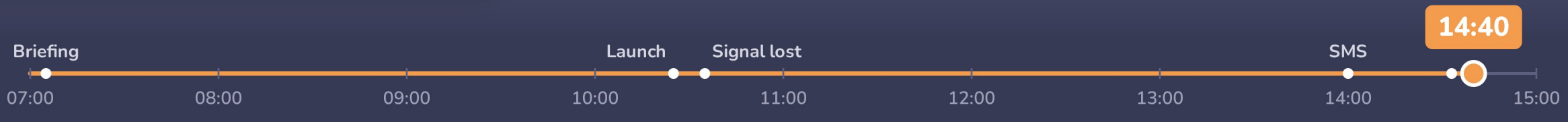
BLIND FLIGHT







Did the camera survive the bang?



WHAT THE BOX SAW

Space Eagle 🚀🎈

CONNECTION Ok · POSITION Ok · FEDERATED LEARNING No Connection · JUPYTER No Connection



Outside Temp
3.4
°C

Cabin Temp
25.4
°C

Altitude
2,032
m

Vertical Speed
4.6
m/s

Speed over Ground	41 km/h	Humidity	30.6 %
Pressure	799.8 hPa	UVA Index	2.15
CPU Temp	31.5 °C	GPU Temp	31.5 °C
Battery	5.05 V	Battery Datalogger	5.02 V

10:34

Briefing

07:00 · 08:00 · 09:00 · 10:00 · 11:00 · 12:00 · 13:00 · 14:00 · 15:00

WHAT THE BOX SAW

Space Eagle 🚀🎈

CONNECTION No Connection | POSITION Ok | FEDERATED LEARNING No Connection | JUPYTER No Connection



Outside Temp
-46.3
°C

Cabin Temp
19.4
°C

Altitude
9,819
m

Vertical Speed
4.8
m/s

Speed over Ground	20 km/h	Humidity	15.8 %
Pressure	267.1 hPa	UVA Index	0.99
CPU Temp	28.0 °C	GPU Temp	28.9 °C
Battery	5.05 V	Battery Datalogger	4.98 V



WHAT THE BOX SAW

Space Eagle 🚀🎈

CONNECTION No Connection · POSITION Ok · FEDERATED LEARNING No Connection · JUPYTER No Connection



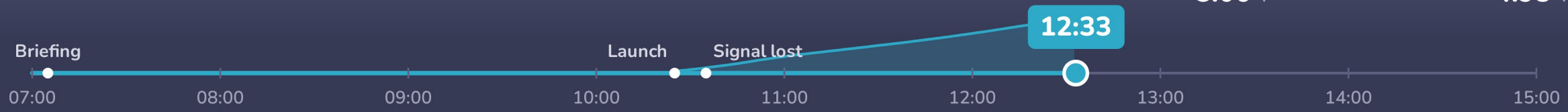
Outside Temp
0.5
°C

Cabin Temp
7.8
°C

Altitude
35,312
m

Vertical Speed
4.6
m/s

Speed over Ground	23 km/h	Humidity	5.0 %
Pressure	6.4 hPa	UVA Index	8.25
CPU Temp	16.0 °C	GPU Temp	16.5 °C
Battery	5.06 V	Battery Datalogger	4.98 V



WHAT THE BOX SAW

Space Eagle 🚀🎈

CONNECTION No Connection · POSITION Ok · FEDERATED LEARNING No Connection · JUPYTER No Connection



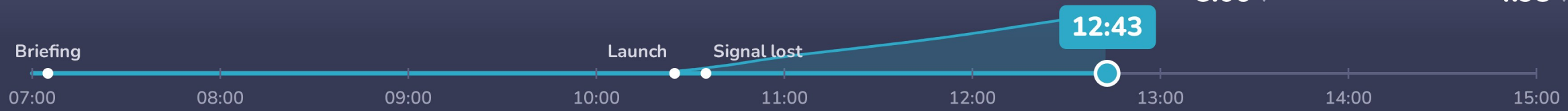
Outside Temp
4.9
°C

Cabin Temp
8.8
°C

Altitude
37,802
m

Vertical Speed
2.8
m/s

Speed over Ground	20 km/h	Humidity	0.1 %
Pressure	4.9 hPa	UVA Index	0.88
CPU Temp	16.5 °C	GPU Temp	16.8 °C
Battery	5.06 V	Battery Datalogger	4.98 V



WHAT THE BOX SAW

In the air
3:04
hours

Highest
37,823
m

Fastest fall
280
km/h

Coldest outside
−50.5
°C
cabin never below +1.4 °C



WHAT THE BOX SAW



FINAL CHECK

Box	found
Flight data	complete
GPU	survived

Map © OpenStreetMap contributors

YOU

Q&A

Video, slides & more

heureka-labs.de/talks/space-eagle