

# No-Fly Zone

Drone Security  
and  
Counter UAS Workshop

CRACCON



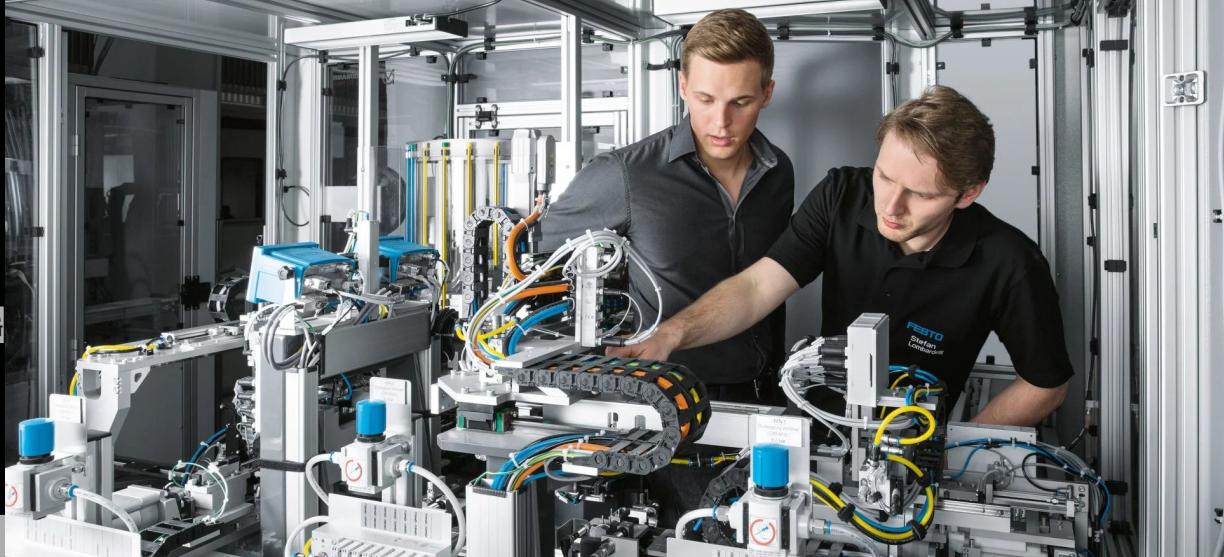
# Who Am I?

## Seedon D'Souza

Security Test Engineer @ Festo AG & Co. KG

- OT/Embedded Security
- EU's CRA & RED Directives
- OSINT

LinkedIn : [/in/seedon](https://www.linkedin.com/in/seedon/) | X : [@SeedonD](https://twitter.com/@SeedonD)



Keep It Simple Silly Fuzzer JTAG/SWD  
<https://kiss-fuzz.readthedocs.io>



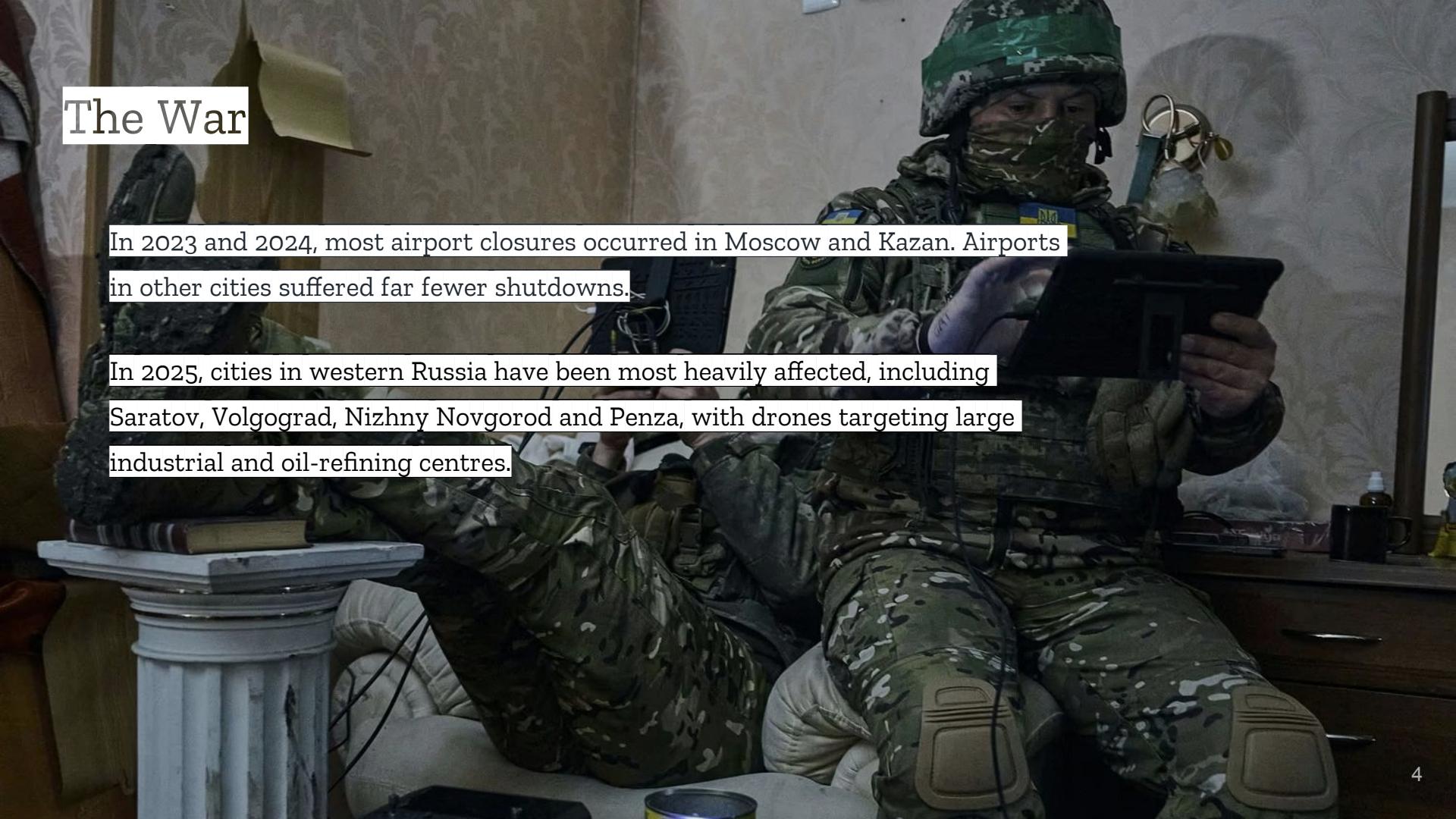
All flights were suspended at Tianjin Airport on September 11 due to drone activity.



We are Going to Have a Catastrophic Event": Drone Incursions in Restricted Airspace are Surging in 2025

Tim McMillan·May 30, 2025

# The War



In 2023 and 2024, most airport closures occurred in Moscow and Kazan. Airports in other cities suffered far fewer shutdowns.

In 2025, cities in western Russia have been most heavily affected, including Saratov, Volgograd, Nizhny Novgorod and Penza, with drones targeting large industrial and oil-refining centres.

# The War



The Ukraine conflict has seen an unprecedented deployment of small quadrotors, FPV (First Person View) drones, and medium-class UAVs on both sides.

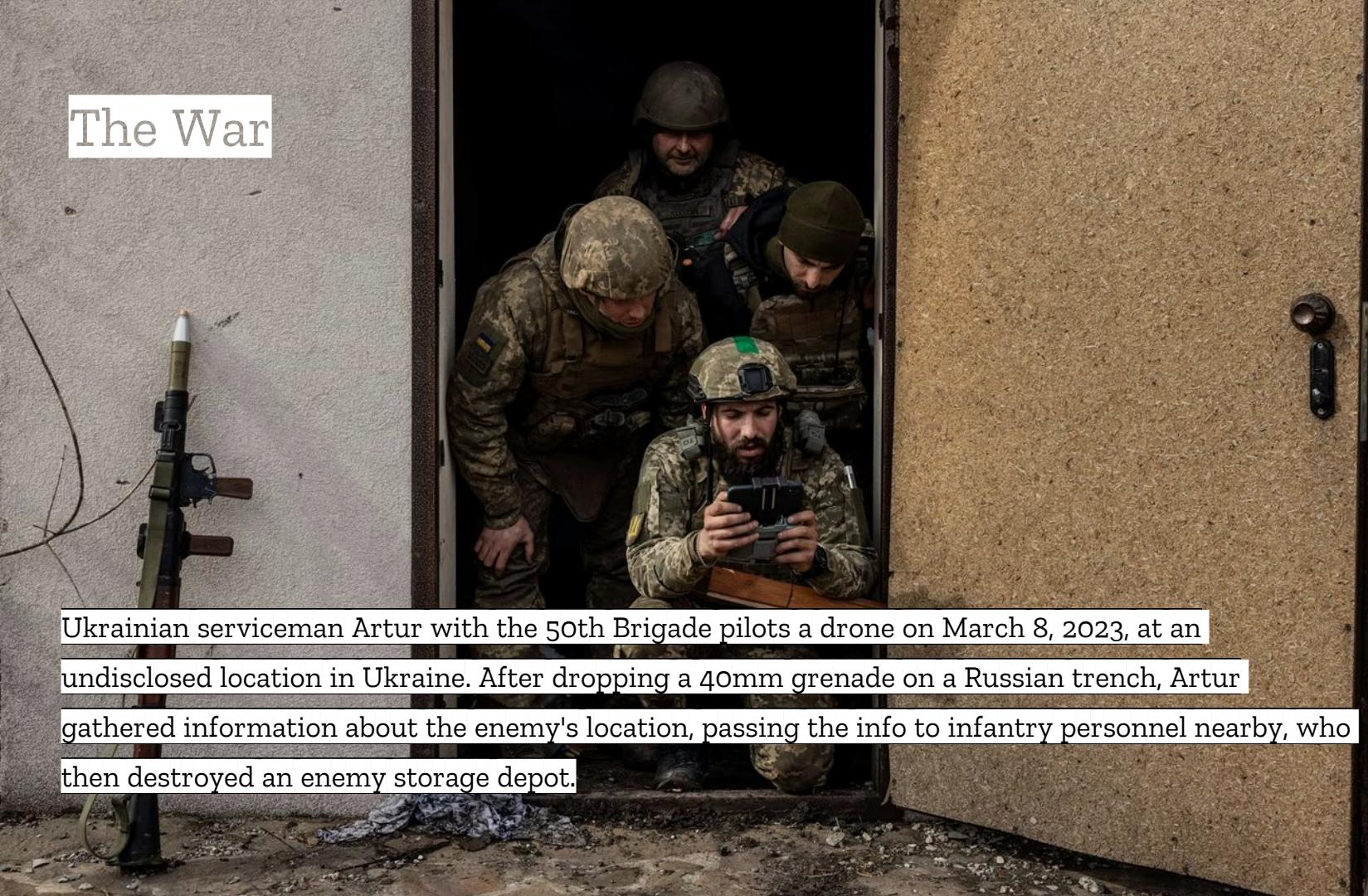
An servicemen of the 15th Operative Purpose Brigade Kara-Dag, of the National Guard of Ukraine, prepare a Darts strike drone for flight over positions of Russian troops near Kupyansk, Kharkiv region, Ukraine May 11, 2025.

# The War



A drone operator with the Ukrainian Army's 93rd Brigade attaches grenades to a drone on February 18, 2023, in Bakhmut, Ukraine.

# The War



Ukrainian serviceman Artur with the 50th Brigade pilots a drone on March 8, 2023, at an undisclosed location in Ukraine. After dropping a 40mm grenade on a Russian trench, Artur gathered information about the enemy's location, passing the info to infantry personnel nearby, who then destroyed an enemy storage depot.

# The War



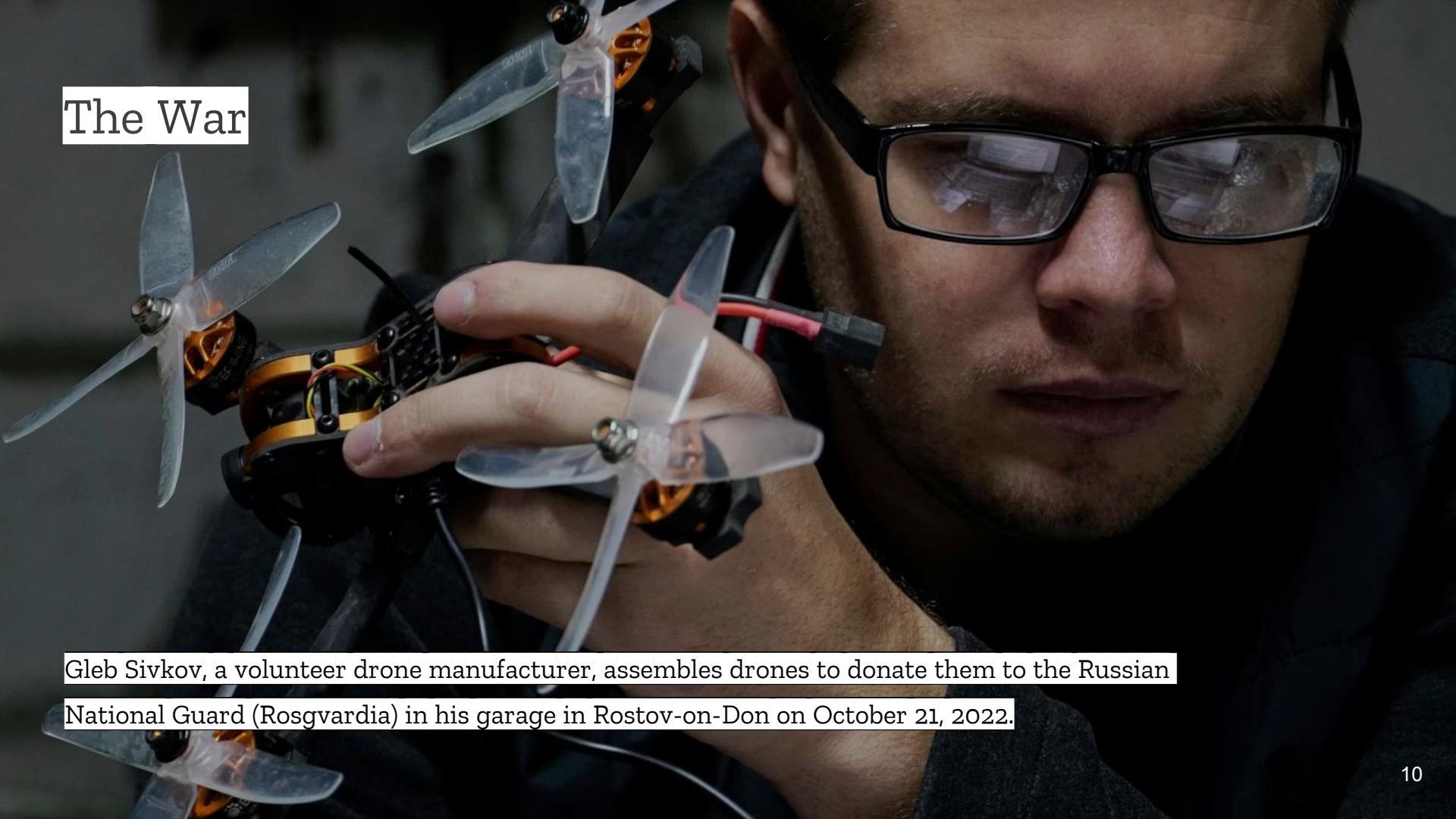
Clouds of smoke rise above a target, viewed on a monitor, as a Ukrainian serviceman of the Adam tactical group operates a drone to spot Russian positions near the city of Bakhmut, Donetsk region, on April 16, 2023.

# The War



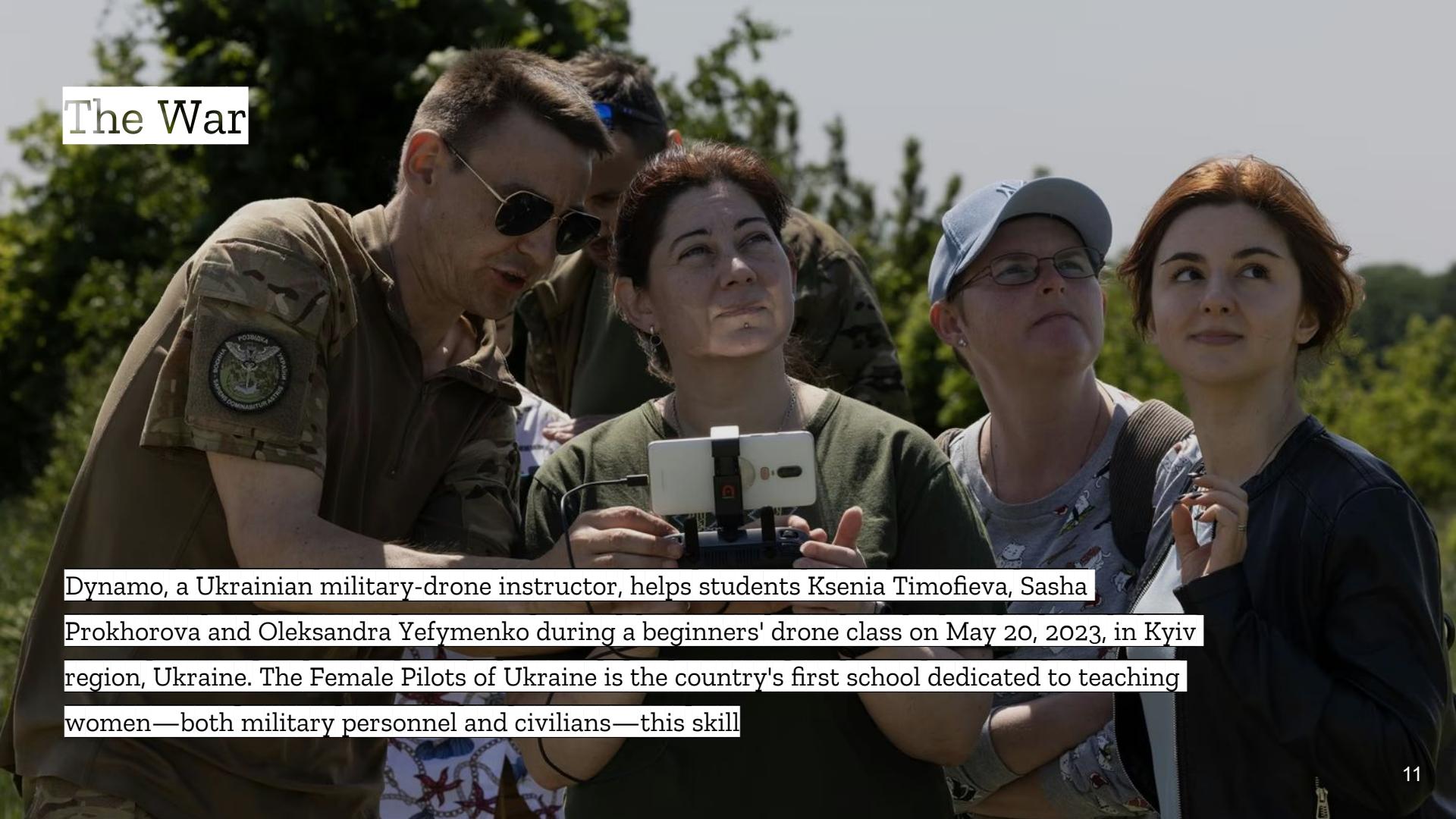
Ukrainian military personnel learn to fly drones with bombs attached at a special school in the Lviv region on May 12, 2023. The school is funded by KOLO, a Ukrainian foundation running a pilot school of drones and UAVs for the military.

# The War



Gleb Sivkov, a volunteer drone manufacturer, assembles drones to donate them to the Russian National Guard (Rosgvardia) in his garage in Rostov-on-Don on October 21, 2022.

# The War



Dynamo, a Ukrainian military-drone instructor, helps students Ksenia Timofieva, Sasha Prokhorova and Oleksandra Yefymenko during a beginners' drone class on May 20, 2023, in Kyiv region, Ukraine. The Female Pilots of Ukraine is the country's first school dedicated to teaching women—both military personnel and civilians—this skill

# The War



A Ukrainian soldier uses an anti-drone gun against a Russian drone as he sits in a trench near Avdiivka, in the Donetsk region, on April 28, 2023.

# DJI Drone-ID

This project is a receiver for **DJI's Drone-ID protocol**. The receiver works either live with an **SDR**, or offline on **pre-recorded captures**.

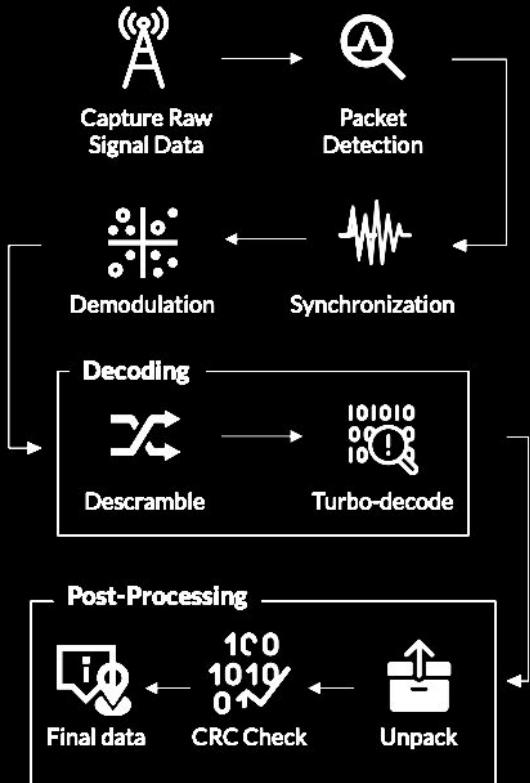
The live receiver additionally requires the **UHD driver** and quite powerful machines (for captures at **50 MHz bandwidth**).



## Drone Security and the Mysterious Case of DJI's DroneID

Schiller, Nico and Chlosta, Merlin and Schloegl, Moritz and Bars, Nils and Eisenhofer, Thorsten and Scharnowski, Tobias and Domke, Felix and Schröder, Lea and Holz, Thorsten

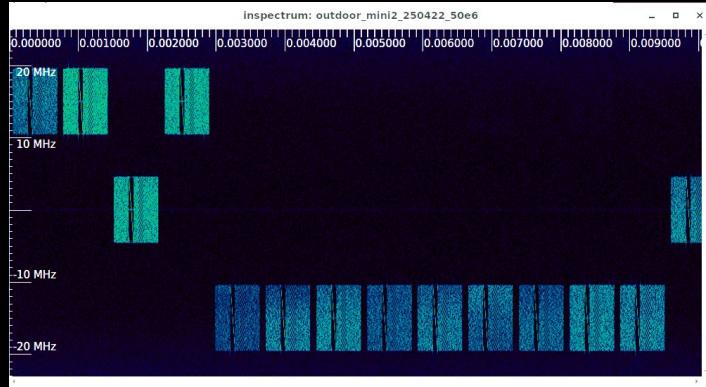
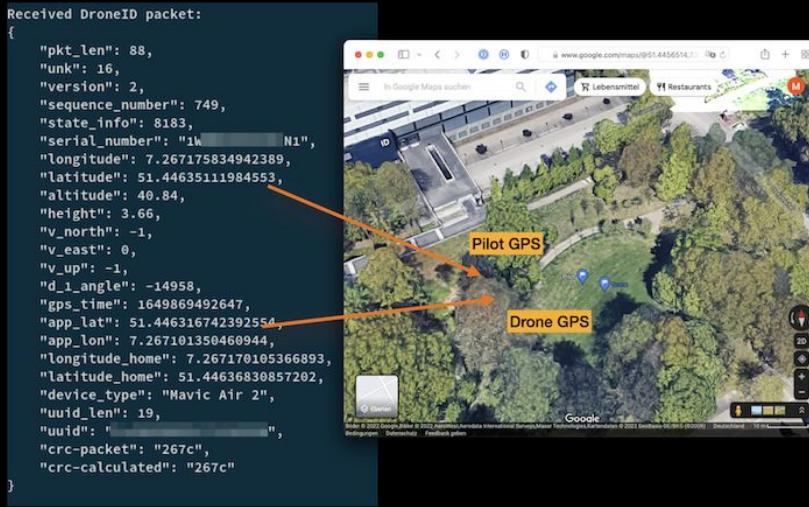
Network and Distributed System Security Symposium (NDSS) . 2023



# DJI Drone-ID

The software is a proof-of-concept receiver that was used to reverse-engineer an unknown protocol. Hence, it is not optimized for bad RF conditions, performance, or range.

- DJI mini 2, DJI Mavic Air 2

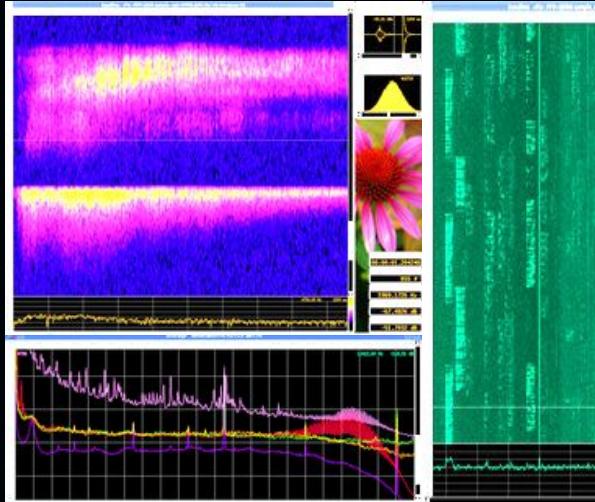


You can use `inspectrump` to visualize the raw sample file:

```
sudo apt install inspectrump
inspectrump -r 50e6 samples/mini2_sm
```

# Reversing DJI Drone-ID

*... How to listen on the Wireless Physical Layer?*



Signal Analyzer Software (e.g., baudline,  
inspectrum)

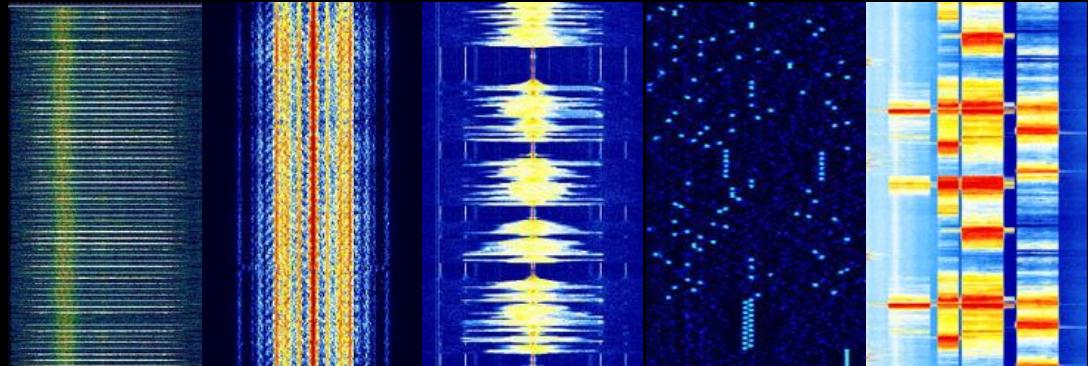


Software Defined Radio (SDR)

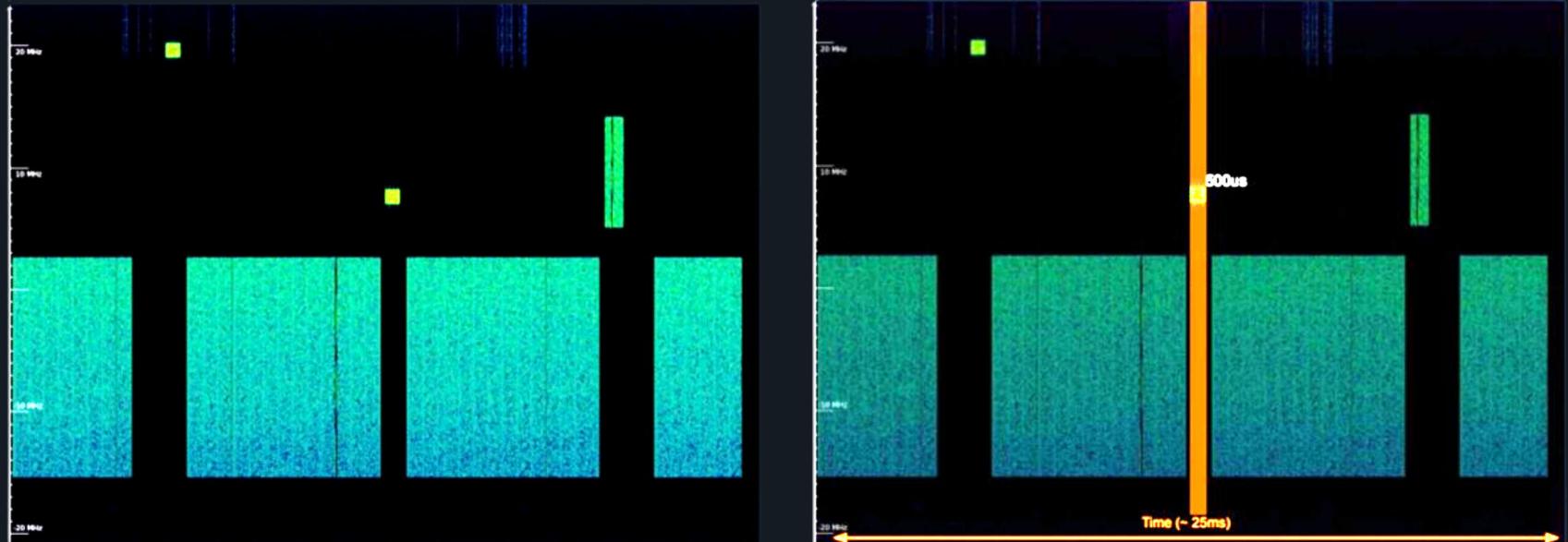
## Signal Capture (I/Q)

[db.satnogs.org](http://db.satnogs.org) - Community-driven satellite signal database.

[sigidwiki.com](http://sigidwiki.com) - Huge library of real-world signals (AM, FM, telemetry, satellite, drones, etc.).

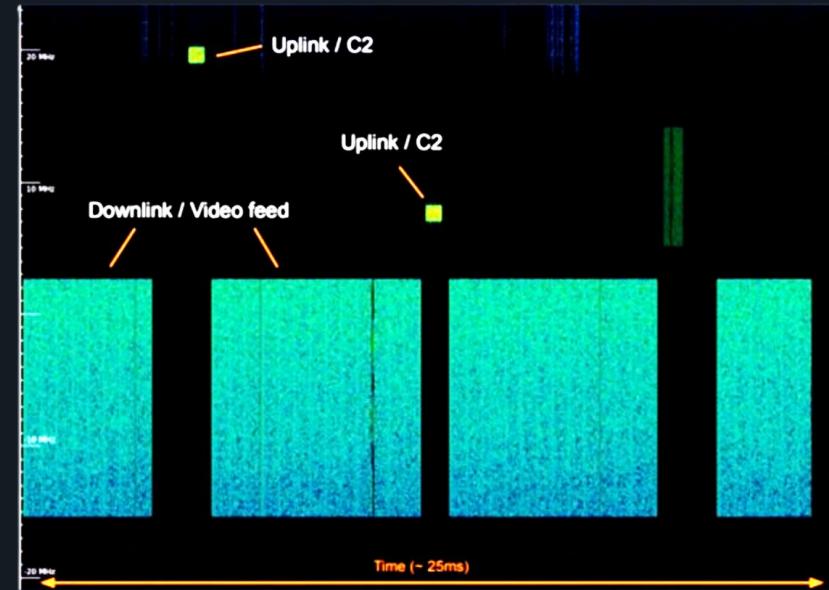
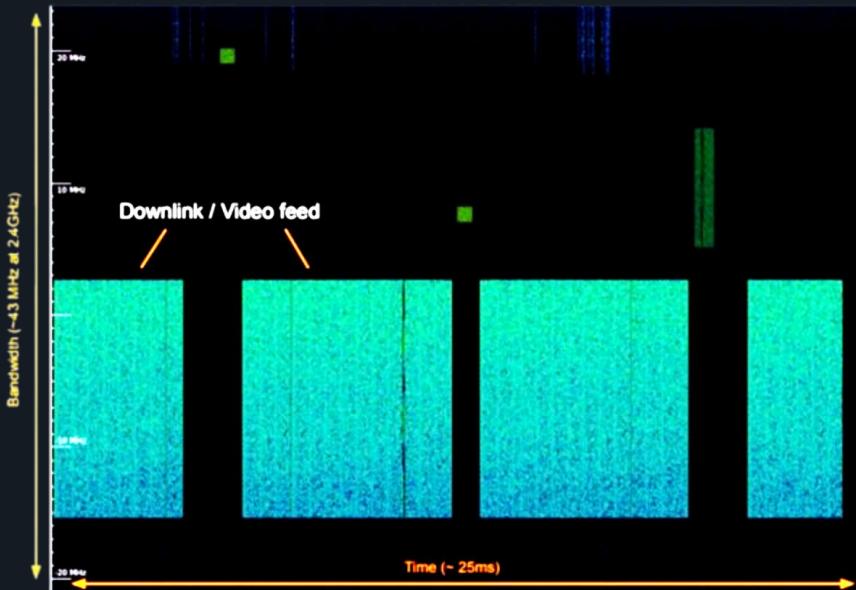


# Reversing DJI Drone-ID



Signal Analyzer Software (e.g., baudline, inspectrum)

# Reversing DJI Drone-ID



Signal Analyzer Software (e.g., baudline, inspectrum)

# Reversing DJI Drone-ID

