

# Jammertest 2023

Kristian Svartveit - Norwegian Space Agency



Norwegian Communications Authority



**Statens vegvesen**

Norwegian Public Roads  
Administration

**FFI** Norwegian Defence  
Research Establishment

**Justervesenet**

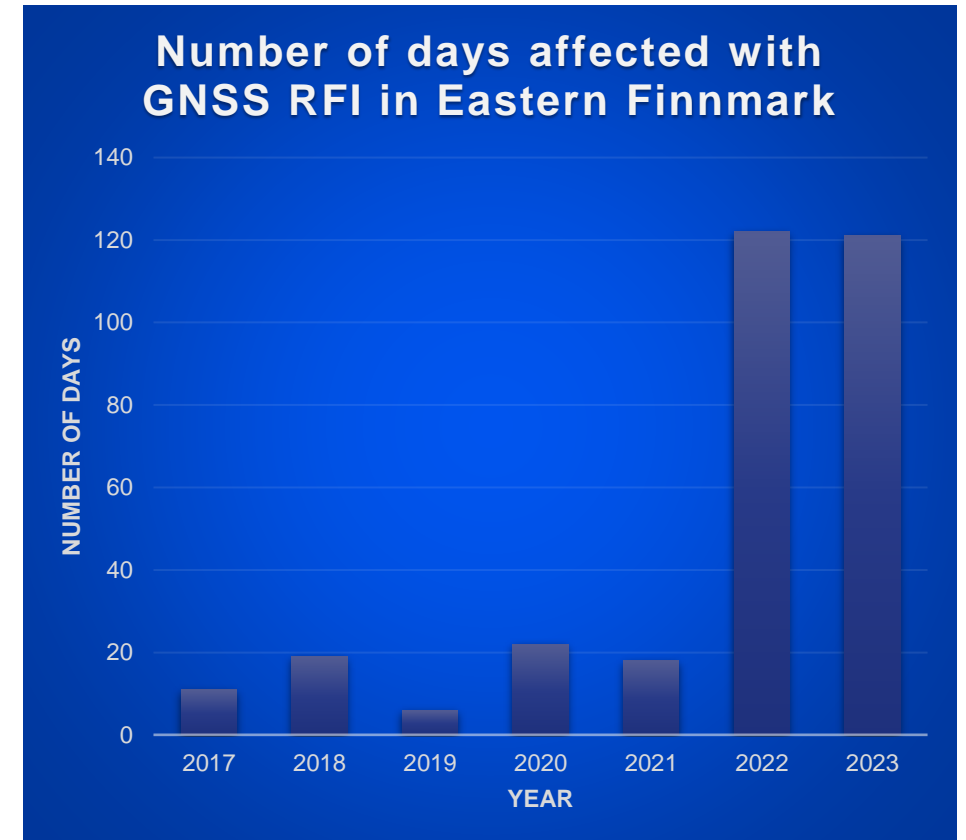


**Norsk Romsenter**  
Norwegian Space Agency

# Background

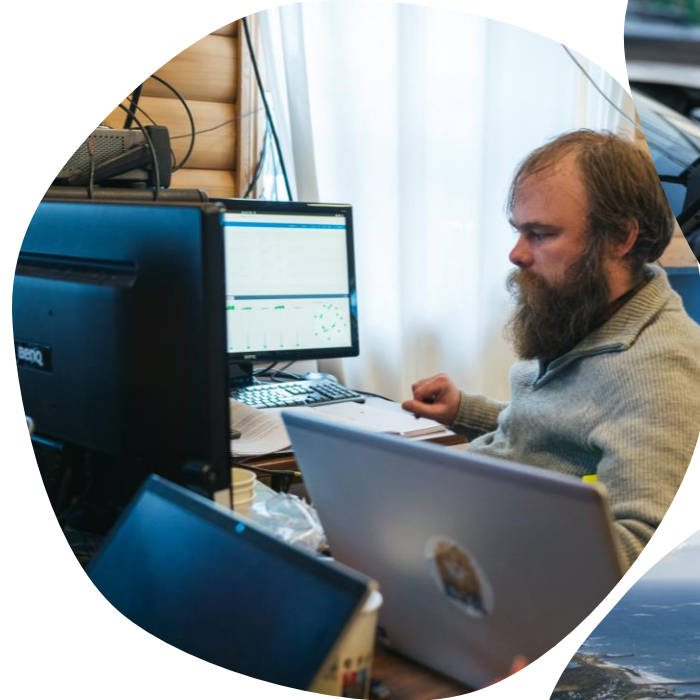
## The RFI situation

- The RF environment that GNSS signals have to exist in, have become less safe over the last years. This is a trend Norwegian authorities expect to continue
- GNSS signals are weak and can therefore easily be jammed, and the civil signals are open so they can “easily” be spoofed



# What do we want to achieve?

- Public awareness
- Increase competency
- Motivate production of robust equipment
- Bring experts together
- Sharing



Photos: David Jensen @jensenmedia

# Jammertest

## Worldwide Participation

200 participants from more than 60 companies and organizations worldwide (Norway, Sweden, Finland, Denmark, Lithuania, Poland, Belgium, Netherlands, Czech Republic, France, Germany, Italy, UK, Canada, USA, Israel, Japan ++)



Photo: David Jensen @jensenmedia

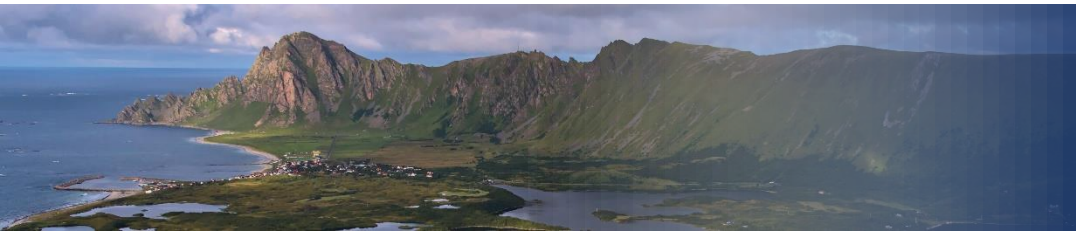




# Jammertest 2023

September 18th – 22nd

Where?  
Andøya!



# Jammertest 2023

## Test locations

Three locations, where we can work in parallel:

1: Main, high power jammer and sophisticated spoofing attacks

2: Small, low power jammers, «sand box»

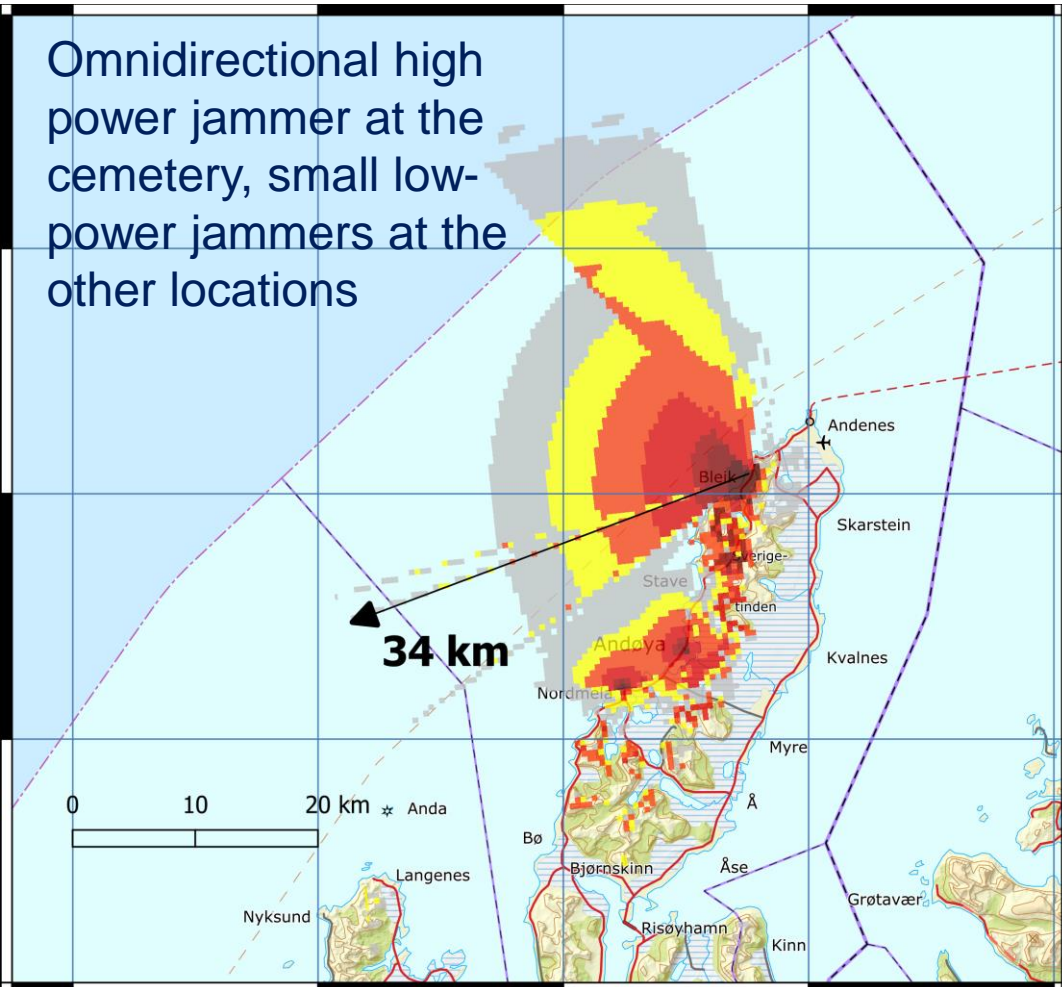
3: Small, low power jammers in and on cars, straight piece of road with limited traffic to test driving scenarios

Participants are free to move between and use the different locations

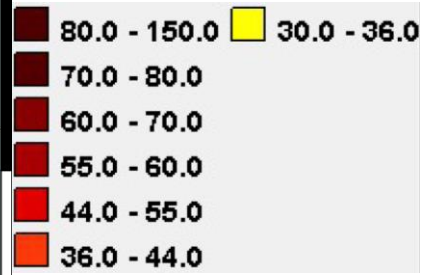


# Jamming signal contour plots at 5 ft above ground level (AGL)

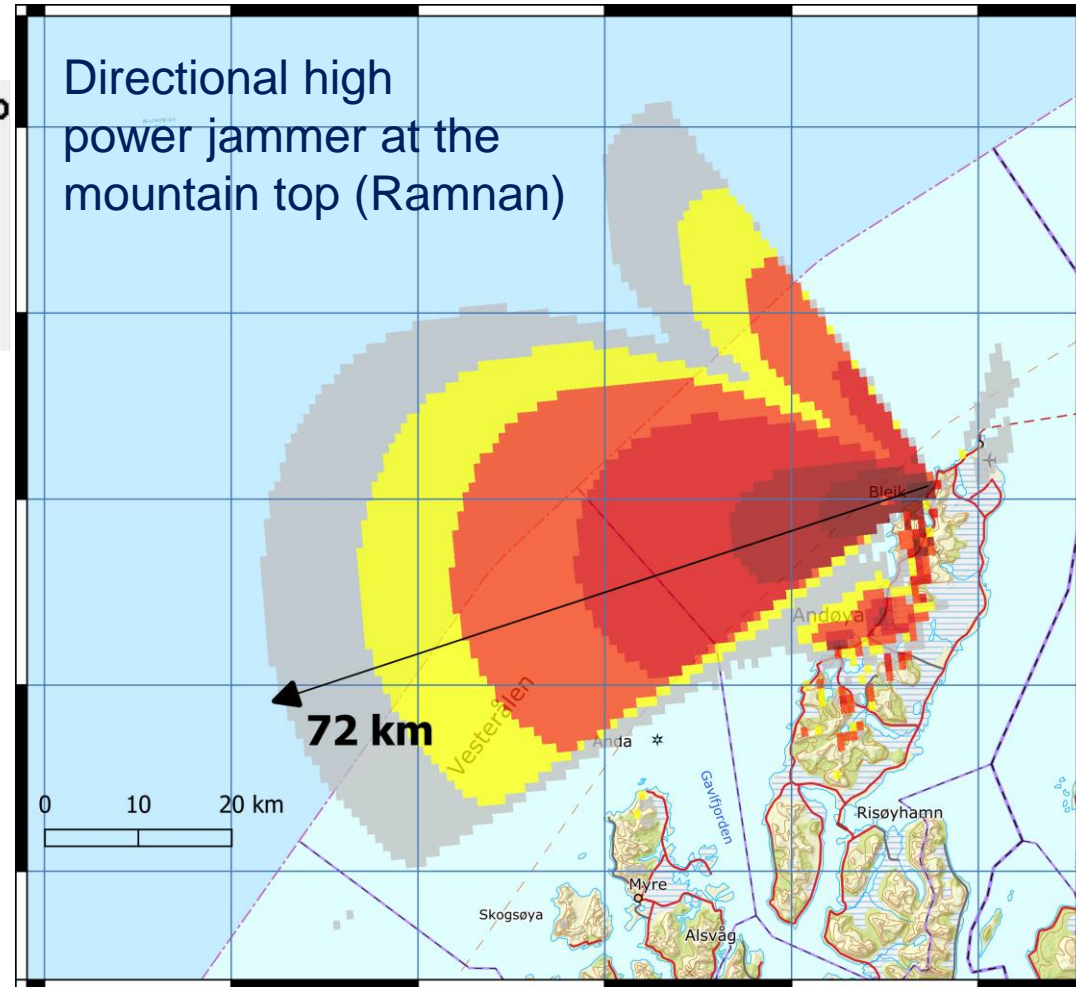
Omnidirectional high power jammer at the cemetery, small low-power jammers at the other locations



Color scale (J/S)



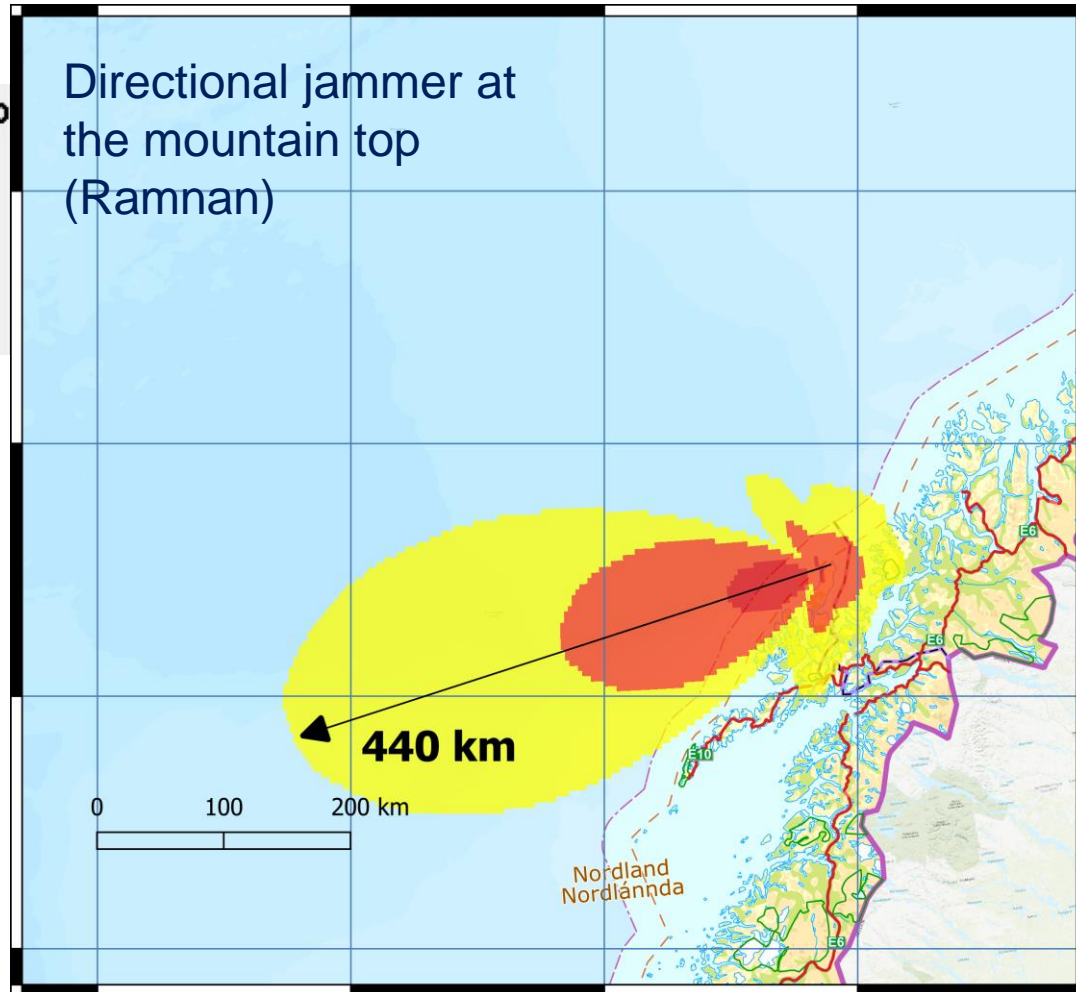
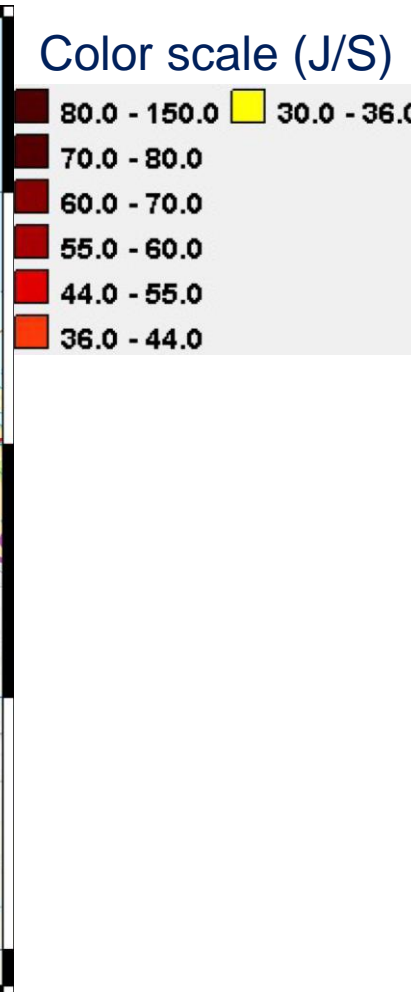
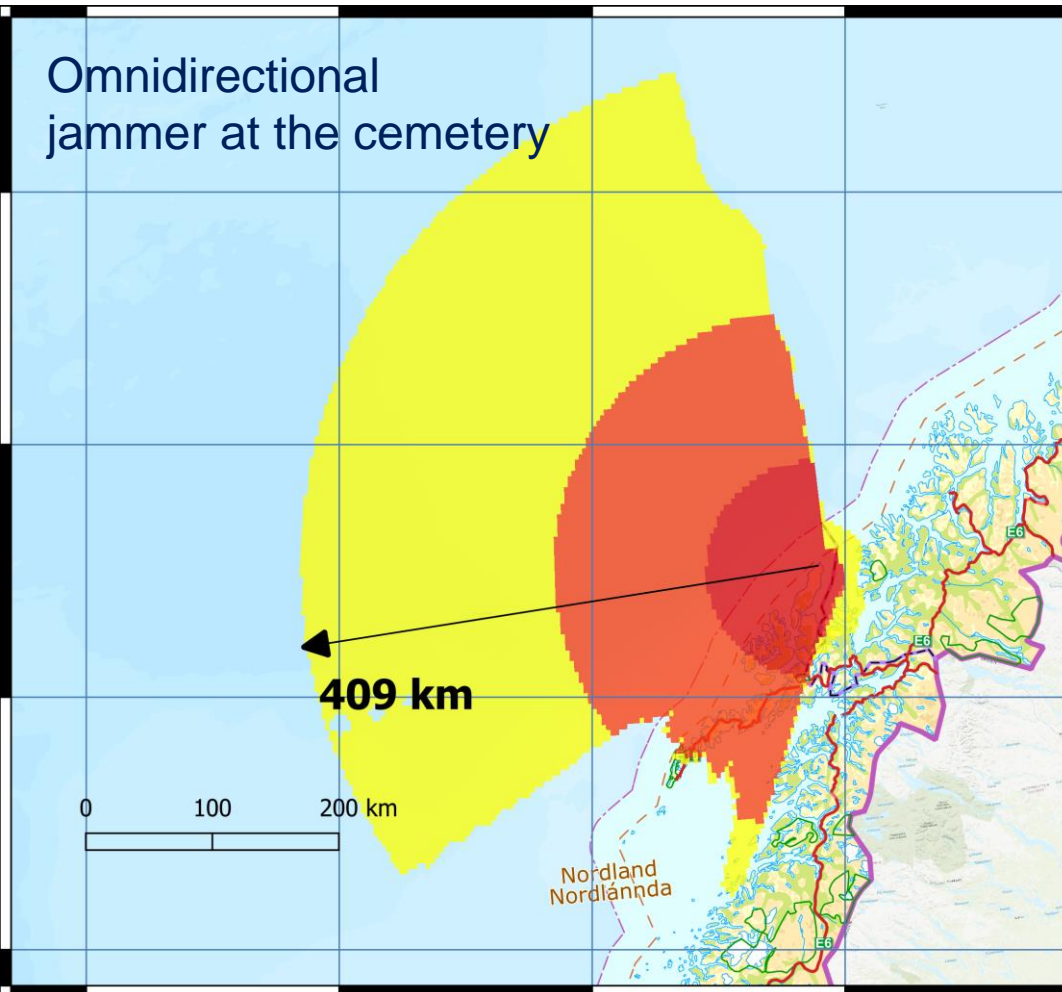
Directional high power jammer at the mountain top (Ramnan)



Simulations: FFI



# Jamming signal contour plots at 40 000 ft above sea level (MSL)



Simulations: FFI

JAMMERTEST 2023 – September 18<sup>th</sup> – 22<sup>nd</sup>



# Jammertest 2024!

Same Time, Same Place, Same Frequencies. Stay Tuned!

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