

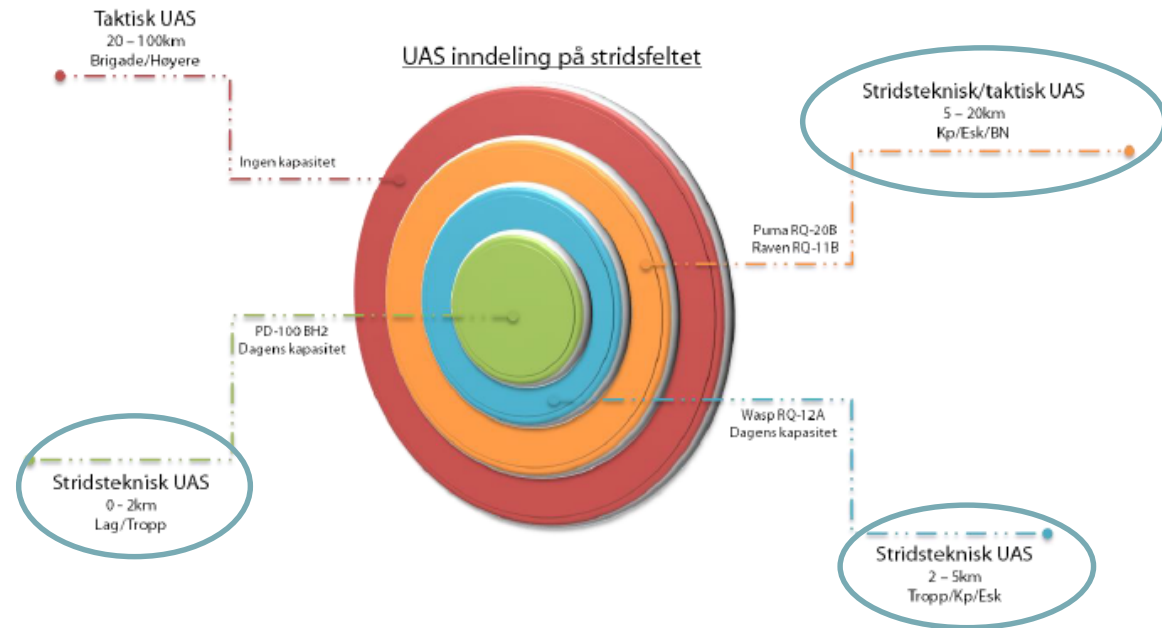
# NUASA - Norwegian UAS Alliance

FSI's Programkonferanse Luft – 13 Februar 2020



# Status P5099 Stridsteknisk UAS til Forsvaret

- Definisjonsfasen påbegynt primo 2019
- Endret navn fra NANO UAV II til Stridsteknisk UAS til Forsvaret
- Oppdrag
  - Rekognosering og overvåking
  - Alle typer lysforhold
- Behov
  - Nano
  - Innendørskapasitet
  - VTOL 2-5km
  - 5-20km rekkevidde

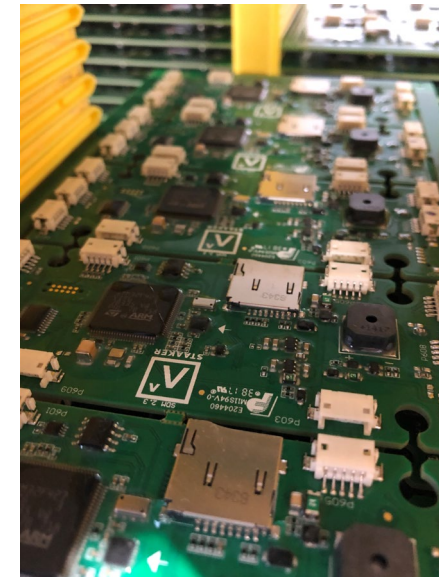
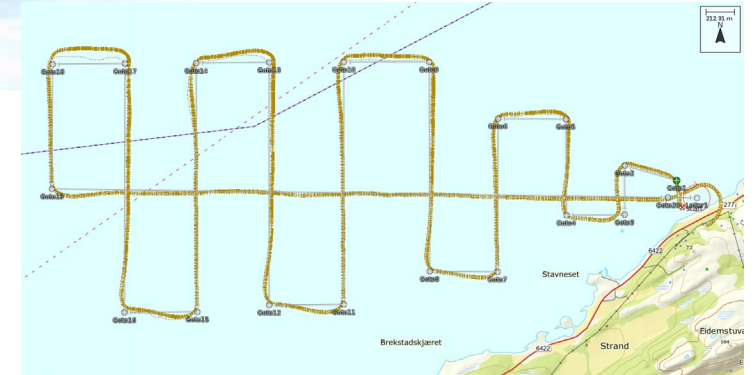


# NUASA key facts

- 220 (+) employees
- Annual revenues (2019) of 260 million NOK (+)  
– more than 50% export to ~25 countries
- Norwegian owned
- Offices in Sandnes, Fornebu, Kjeller, Hønefoss and Trondheim
- OEM for 8 different UAV/UAS – designed, developed and manufactured in Norway
- Multiple projects with Forskningsrådet, FFI/ICE Works and 4 universities involving students, PhDs and research

**Represents a leading European UAS industry eco-system from Norway**

**Design-Development-Production-Training-Operations- Maintenance**



# Drones that make a difference



- A leading European provider of drone solutions to B2G and B2B
- Founded in 2014
- 30 employees, soon 50 employees
- Located in Sandnes (HQ), Fornebu, and Frankfurt
- **OEM of the Staaker UAV's**
- Lockheed Martin and Textron Systems representative
- Flight permits:
  - Norway, Denmark, Sweden, Germany, France, Spain, Portugal, Cyprus, Greece





- Staaker BG -100
  - MTOW 2,2 kg (4,4lb)
  - Flexible gimbal for COTS sensors
  - Endurance up to 30 min
  - Serial production in Norway
  
- Staaker BG-200
  - MTOW 25 kg (55lb)
  - Utility payload bay for up to 10 kg (22lb)
  - Endurance upto 120 min





## ROBOT AVIATION

- A Norwegian company with its head office at Eggemoen and subsidiaries in Poland and Sweden, 30 employees
- Develops and manufactures Unmanned Aerial Systems for industrial, governmental and military customers
- Main focus on ISR, Communications and Emergency Response applications
- The «**SKYROBOT**» family of products consists of fixed wing UAS in three classes, the **SkyView** NATO compliant software for ground control stations and **HILS simulators** for operator training and mission preparations



Etter mobil-sammenbruddet i Jølster:

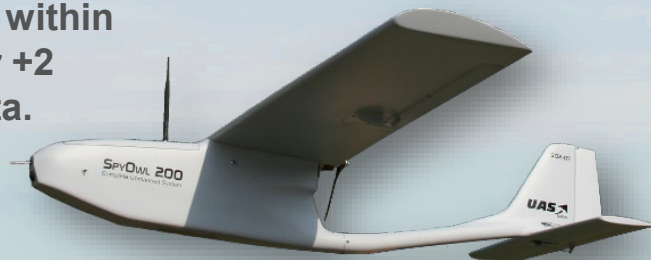
# TESTER 4G-DRONER

**I HØYESTE GRAD MOBIL:**  
Telenor, Andøya Space Center og Robot Aviation samarbeider om å utvikle en beredskapsdrone som kan brukes ved naturkatastrofer eller ulykker. Foto: Robot Aviation

# SKYROBOT™ FAMILY

## SkyRobot FX10

High mobility system, hand launched within minutes, and able to stay airborne for +2 hours, providing Thermal & Video data.



## SkyRobot FX450

Full capability UAS supporting operations in demanding environments such as maritime and border surveillance, with an endurance of +20hrs., EO/IR with laser precision, broadband data-link & Sat-com

## SkyRobot FX20

Optimized +4 hours endurance, for radio-comms as well as surveillance "on-the-run", a optimized fast & quiet tool.



## Ground Control Station

SkyView – our common GCS with NATO/Stanag compliance and full modularity.



# UAV Test site

## Eggemoen Technology Park (ENEG)



- Established in 2005
- Located in Trondheim, Oslo and Eggemoen
- Main markets are geophysical mapping, environmental monitoring and defence/security
- Turnover: 40 mill NOK (2019)
- Employees: 27
- UAV & USV



# PX-31 FALK specifications

Flight time (battery): 1.5 hr  
Flight time (combustion): 8-10 hr  
Empty weight: 15.0 kg  
Max Payload weight: 7.0 kg  
MTOW: 22.0 kg  
Max climb rate: 1.200 fpm  
Operational ceiling: 20.000 ft.  
Dimensions (wing/length): 3.2 m  
Vcruise: 25 m/s  
Vmax: 40 m/s  
Vstall: 14 m/s



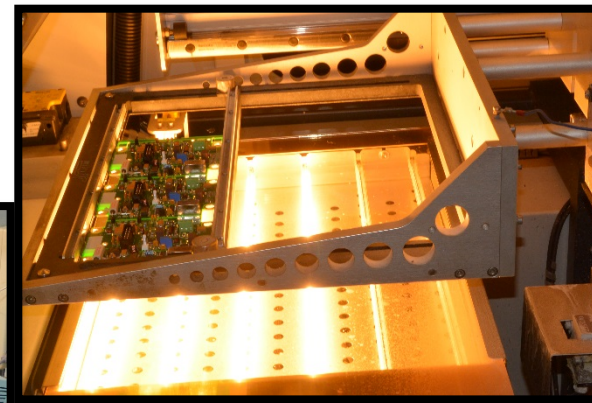
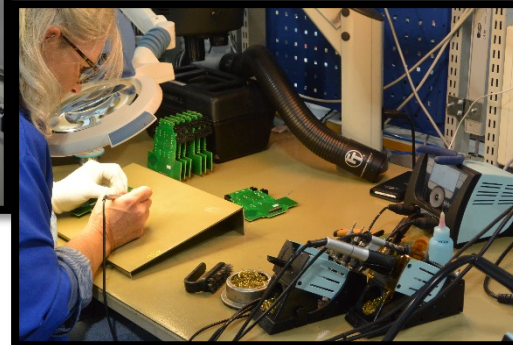
## Technological development

- De-icing system integration (UBIQ Aerospace)
- Advanced routing system (FFI)
- Close relations to NTNU/AMOS

## High-end manufacturing

*Kjeller, Norway*

- large product variety, wide range of customers
- effective BOM import from NOTEfied (Quoting tool)
- effective documentation management (different client input)
- control through the process
- flexible EMS lines, flexible process, flexible operators
- high production capacity, always availability





## COMPANY

### ISO Certificates :

- 9001 :2015           Quality
- 13485:2012        Quality Medical
- 14001:2015        Environment

### Beyond ISO, relating to product requirements:

- UL
- NEMKO
- BRE Global

### Client - audits / Inspections:

- Kongsberg
- Powerbox
- Texas Instruments
- Thales



## ASSEMBLY FACTS

Well adapted to it's purpose, providing

- ✓Flexibility
- ✓Short lead-times
- ✓Build to Customer order
- ✓Customer programming
- ✓Customer Repair
- ✓HUB services

Educated employees working in teams  
Volume flows as well as low runners

- ✓Including Pre series, box build and rework capabilities

Three SMD lines

- ✓Speed
- ✓Flexibility

# Phased array-kommunikasjon



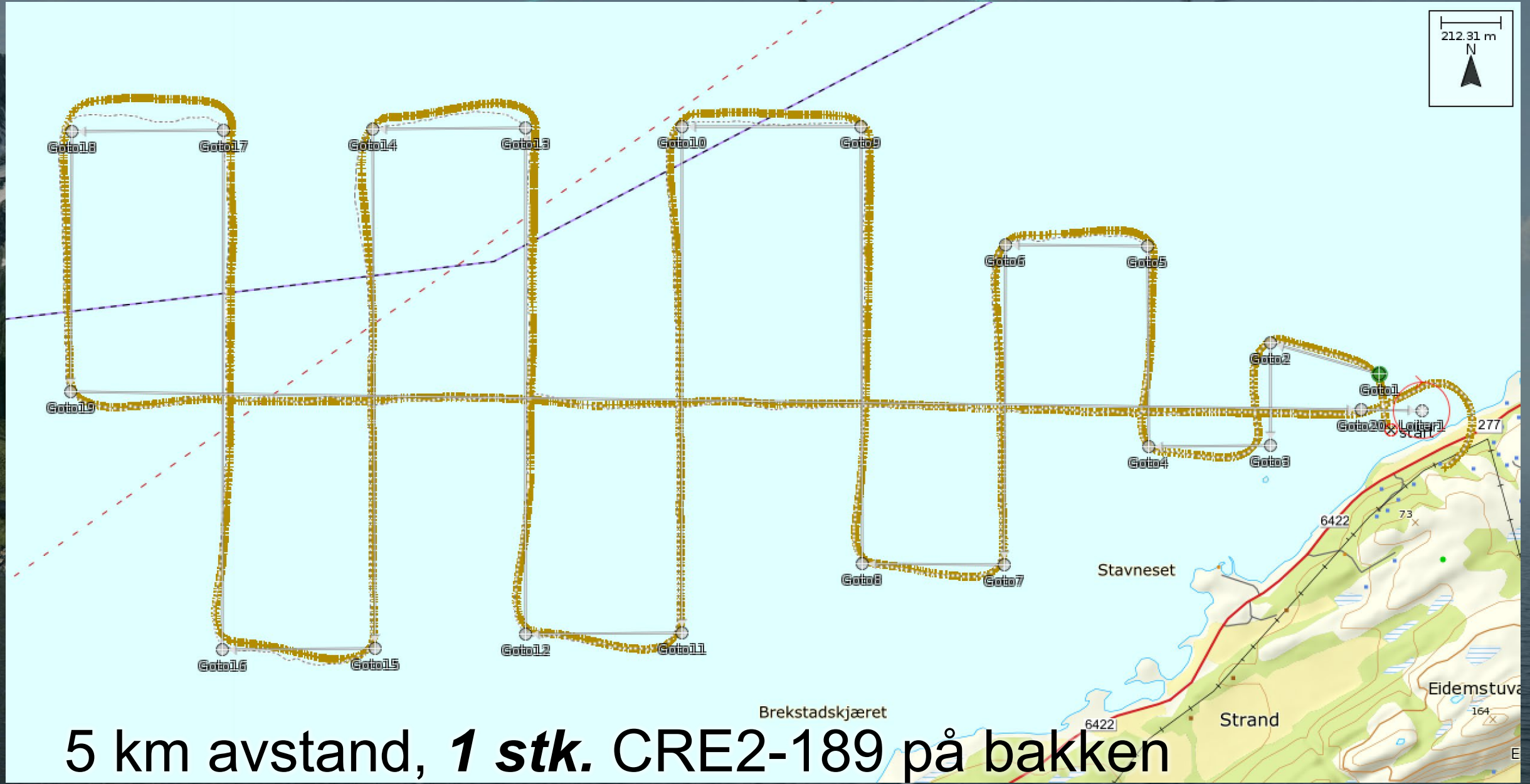
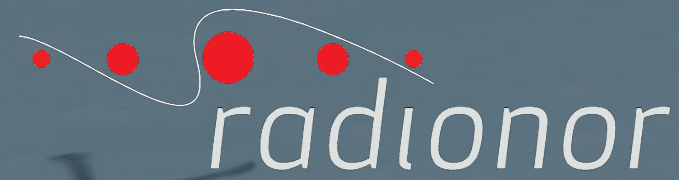
## Konvensjonell teknologi:

- ❖ Stråling i alle retninger
- ❖ >99% tapt RF-energi
- ❖ «Forurensing» av spektrum
- ❖ Lett å detektere/følge/avlytte
- ❖ Mottakelig for jamming fra alle retninger

## Phased array-kommunikasjon:

- ❖ Stråling kun i ønsket retning
- ❖ Ingen bortkastet RF-energi
- ❖ Lang rekkevidde
- ❖ Høy båndbredde
- ❖ Effektiv utnyttelse av spektrum
- ❖ Vanskelig å monitorere/avlytte
- ❖ Hindrer jamming fra uønskede retninger

# GPS-uavhengig navigasjon demonstrert



5 km avstand, **1 stk.** CRE2-189 på bakken

# P5099 – NUASA PRODUCTS

**A – Lightweight UAS**  
60g, 200-500 m

**B – Indoor Flying UAS**

**C – VTOL UAS**  
Range > 2,5 km

**D – Surveillance UAS**  
<25 kg, 5-20 km

Confidential



Confidential



*SkyView operator software / GCS*



*Radio-/datalink infrastructure for command&control of UAVs & payload*



*Manufacturing, service and logistics support*



NUASA can offer a Norwegian “system of systems” based on

- A suite of “fit-for-purpose” UAS (platforms & sensors)
- A common GCS software and user interface
- Simulators for operator training and mission planning/rehearsal
- A common commz infrastructure with state of the art security, range, bandwidth and navigation capabilities
- High-end and scalable manufacturing, service & support

**Norwegian IPR, products and supply chain – International potential**

# Why is this a competitive Norwegian solution?

- Competitive price & performance
- A suite of UAS' – One supplier
- A common, NATO-compliant operating system
- Small logistical & operational footprint
- Made for operation in arctic, maritime climate
- 256 encryption and resistance to jamming
- GPS-denied navigation capability
- National supply, maintenance and support
- Common, local/on-site operator training
- Control of IPR and value chain
- Collaboration user/customer/supplier - future development and integration
- International market potential
  - UK, Sweden, Latvia....
  - Demand for NATO produced sUAV

Takk for oppmerksomheten!

