
radionor
HØYHASTIGHETS
KOMMUNIKASJON
FOR UAV
CORDIS ARRAY RADIO SYSTEM
www.radionor.no
M.s.e.e. Øystein Pedersen, Business Development Manager

KEY CAPABILITIES

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Cordis Array II implementation:

- v «Multi-view» capability detects RF energy in all directions simultaneously.
- v Beam steering processing is able to track an aircraft at Mach 1 passing 2 meters in front of the antenna.
- v Discovering and locking beams for transmitter and receiver in unknown positions is instant (Milliseconds).
- v The instant tracking and detection enables non-line-of-sight operations using energy from any direction.

Nature's implementation of instant multidirectional view

NON-MILITARY

UAV

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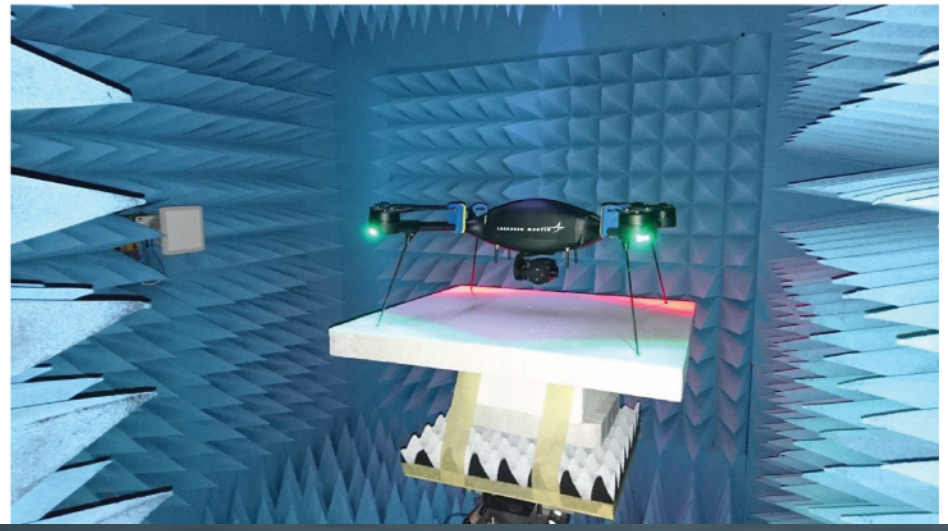
Photo: UMS Skeldar



CRE2-PRODUCTS

CRE2-189
Vertical mounted for
vessels and command posts.
Size: 366 x 366 x 137 mm
Weight: 12.5 kg (antenna)

CRE2-179-UAV
Horizontal mounted for long
Range unmanned vehicles.
Size: 284 x 291 x 53 mm
Weight: 2 kg

CRE2-144-M2
Compact helmet mounted
radio with antennas.
Size: 146 x 78 x 43 mm
Weight: 295 g

CRE2-179
Horizontal mounted for
Vehicles and smaller vessels.
Size: 352 x 352 x 65 mm
Weight: 9.5 kg

CRE2-144-OEM
For compact unmanned
vehicles.
Size: 120 x 65 x 34 mm
Weight: 290 g

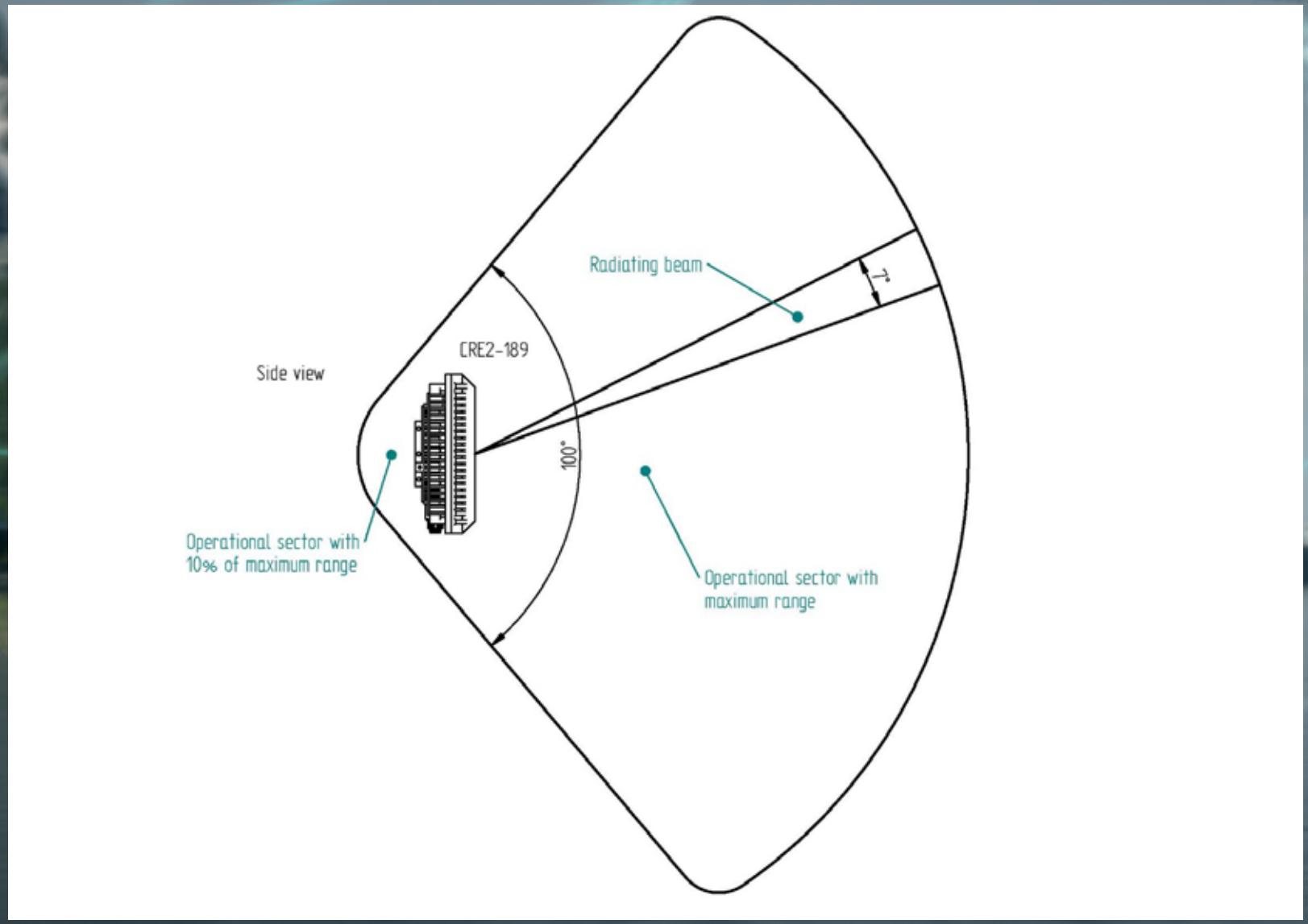
CRE2-144-M2-SMA
Compact radio for external
antennas.
Size: 147 x 78 x 32 mm
Weight: 295 g

CRE2-179-AM
Horizontal mounted for
Manned aircrafts.
Size: 371 x 377 x 53,2 mm
Weight: 5 kg

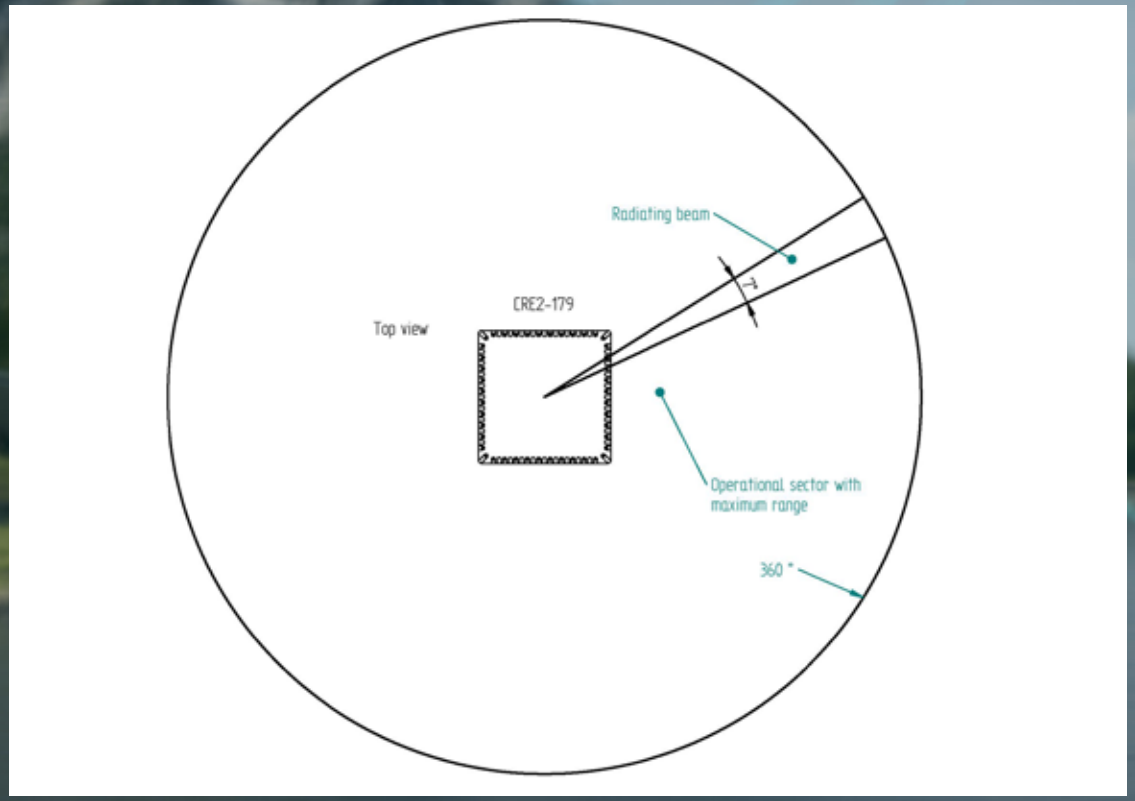
CRE2-144-LW
For ultra lightweight
unmanned vehicles.
Size: 120 x 65 x 6.5 mm
Weight: 85 g

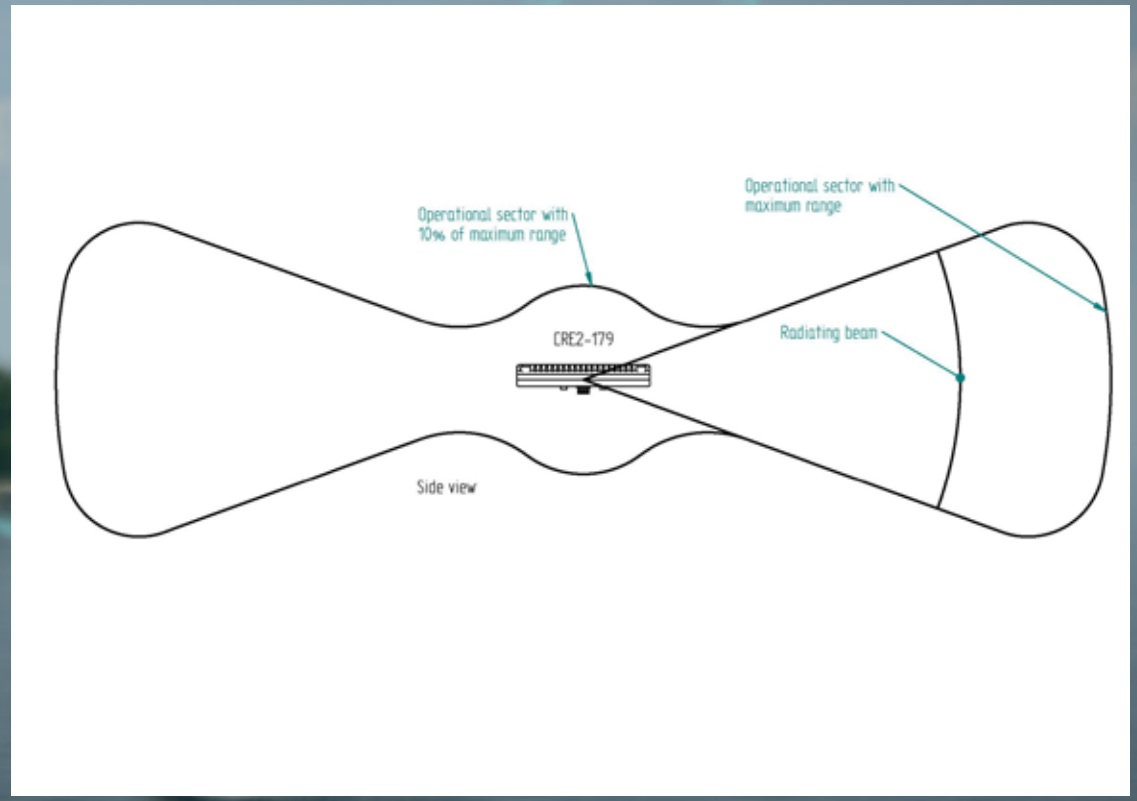
CRE2-144-R70
Expansion payload module
for SkyRanger
Size: 176 x 134 x 66 mm
Weight: 295 g

OPERATIONAL SECTOR CRE2-189



OPERATIONAL SECTOR CRE2-179





ELECTRONIC BEAMSTEERING

Omni directional vs Phased Array High Mobility Communications System

Conventional Omni System:

- Energy radiated in all directions
- >99% wasted RF energy
- Limited range
- Low data rates
- Unwanted spectrum «pollution»
- Easy to monitor by enemy
- Easy to jam & block in VHF/UHF
- Frequency hopping required

Electronic Beamsteering:

- Energy radiated in designated direction
- Little wasted RF energy
- Long range
- High data rates with multiple HD videos
- Effective spectrum utilisation
- Difficult to monitor by enemy
- Narrow beam prevents jamming
- No frequency hopping required

CORDIS ARRAY

PHASED ARRAY SMART ANTENNA SYSTEM

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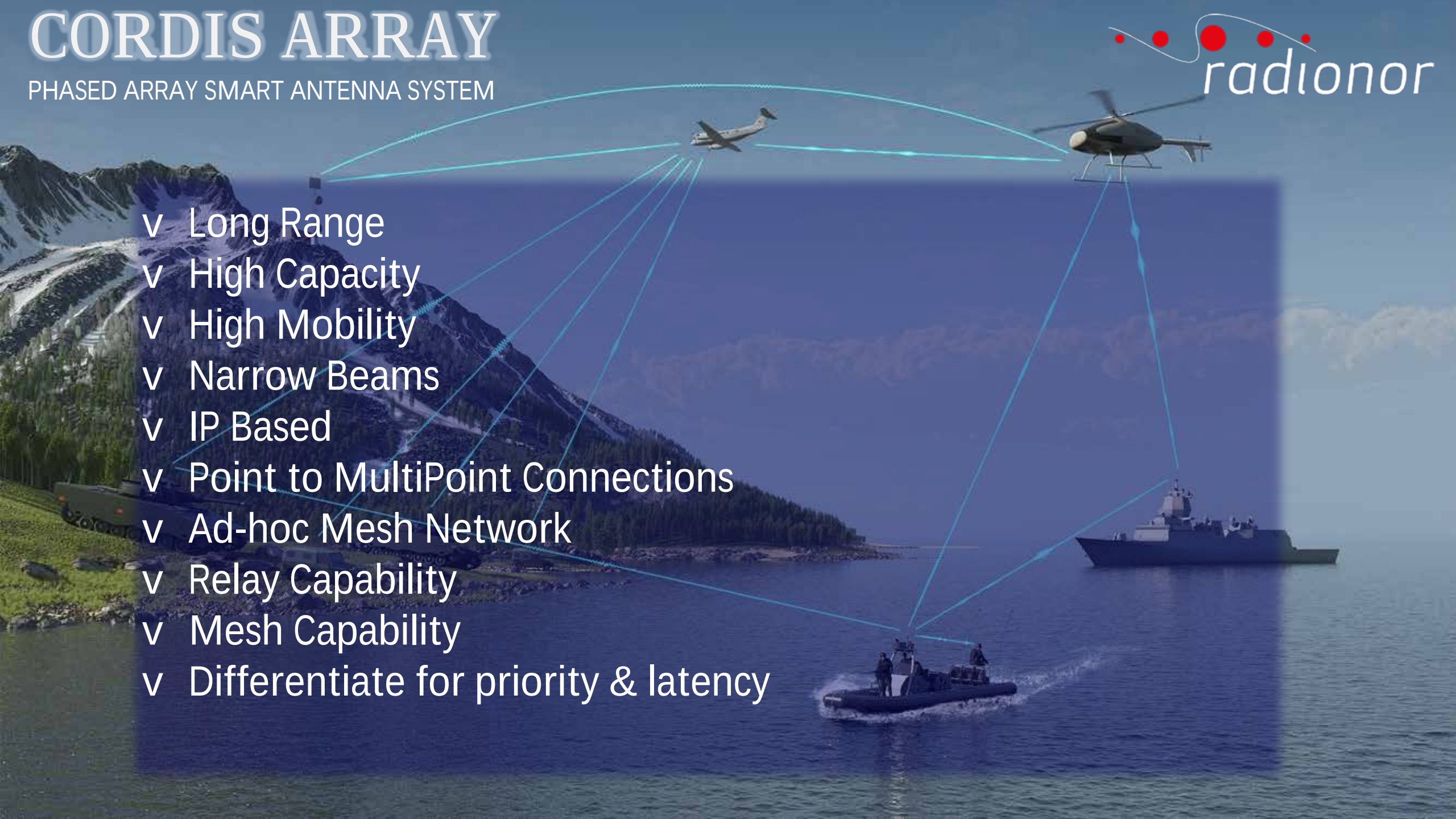

- Long Range
- High Capacity
- High Mobility
- Narrow Beams
- IP Based
- Point to MultiPoint Connections
- Ad-hoc Mesh Network
- Relay Capability
- Mesh Capability
- Differentiate for priority & latency

COMPARING WITH OMNI DIRECTIONAL

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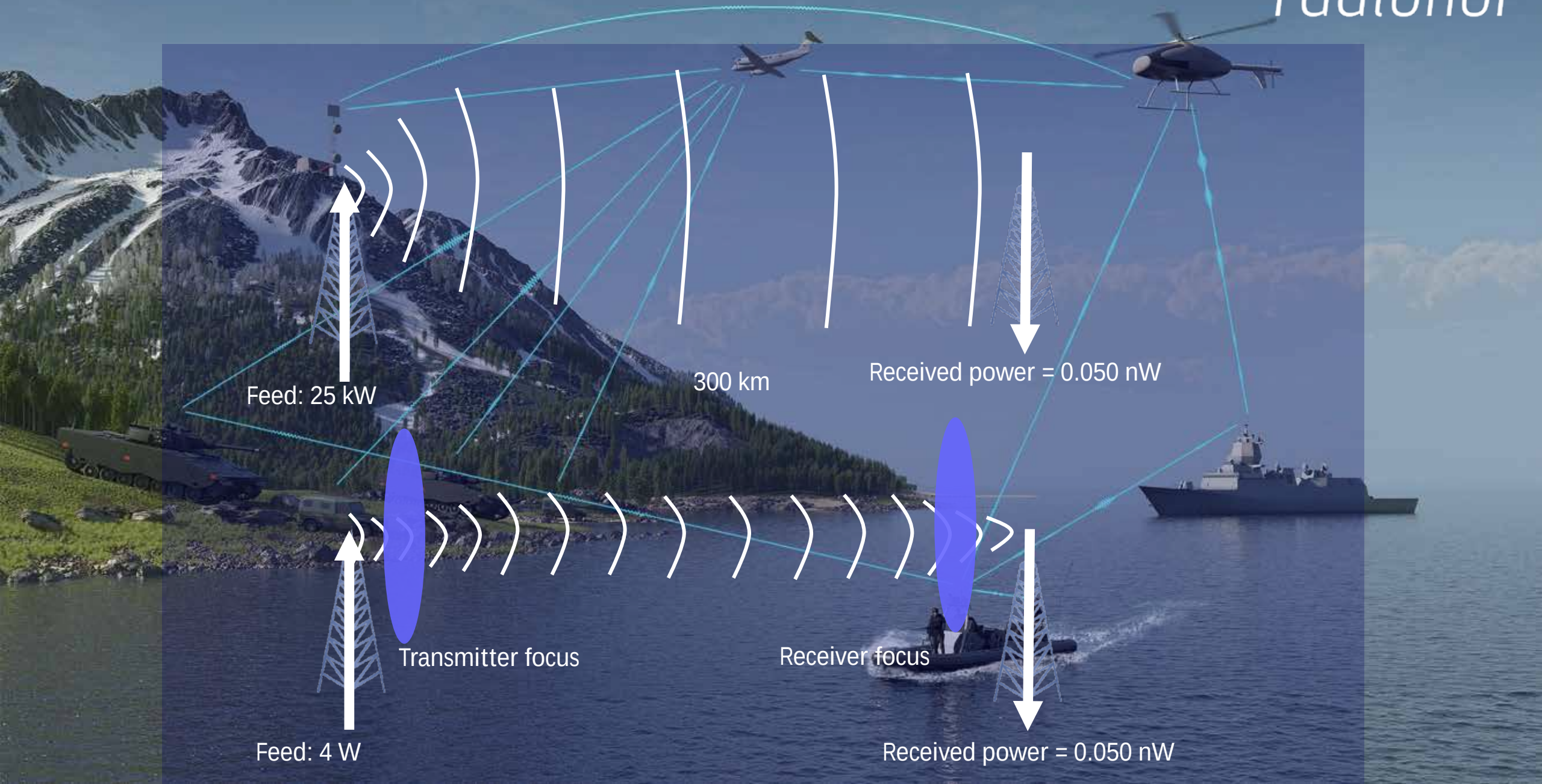

MUM TEAMING OPERATIONS

USEFUL FEATURES FOR A SECURE OPERATION

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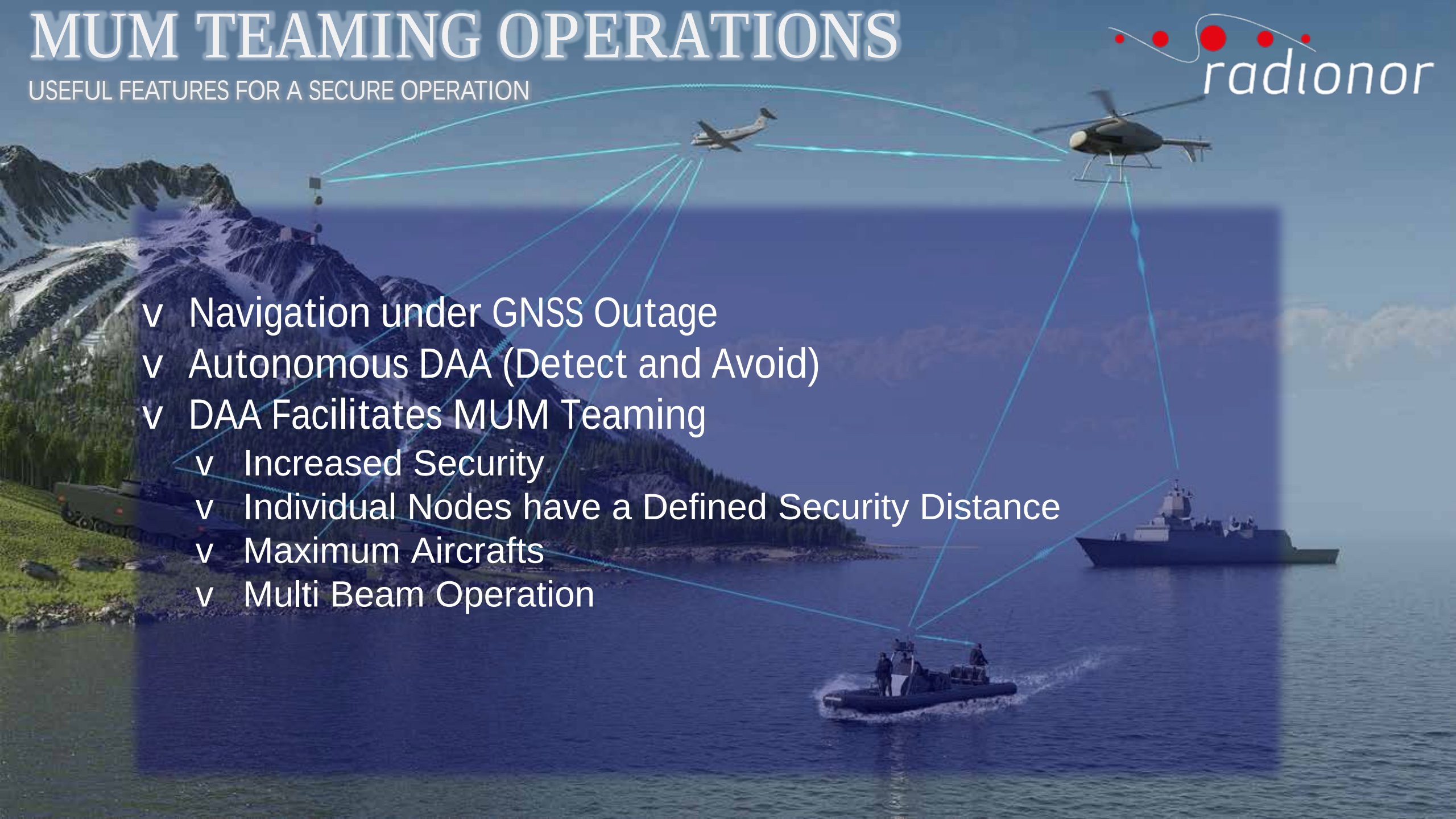

- Navigation under GNSS Outage
- Autonomous DAA (Detect and Avoid)
- DAA Facilitates MUM Teaming
  - Increased Security
  - Individual Nodes have a Defined Security Distance
  - Maximum Aircrafts
  - Multi Beam Operation

MUM TEAMING OPERATION EXAMPLE

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AIR CORRIDOR FOR DRONES ONLY

CRITICAL FOR FREIGHT OPERATIONS

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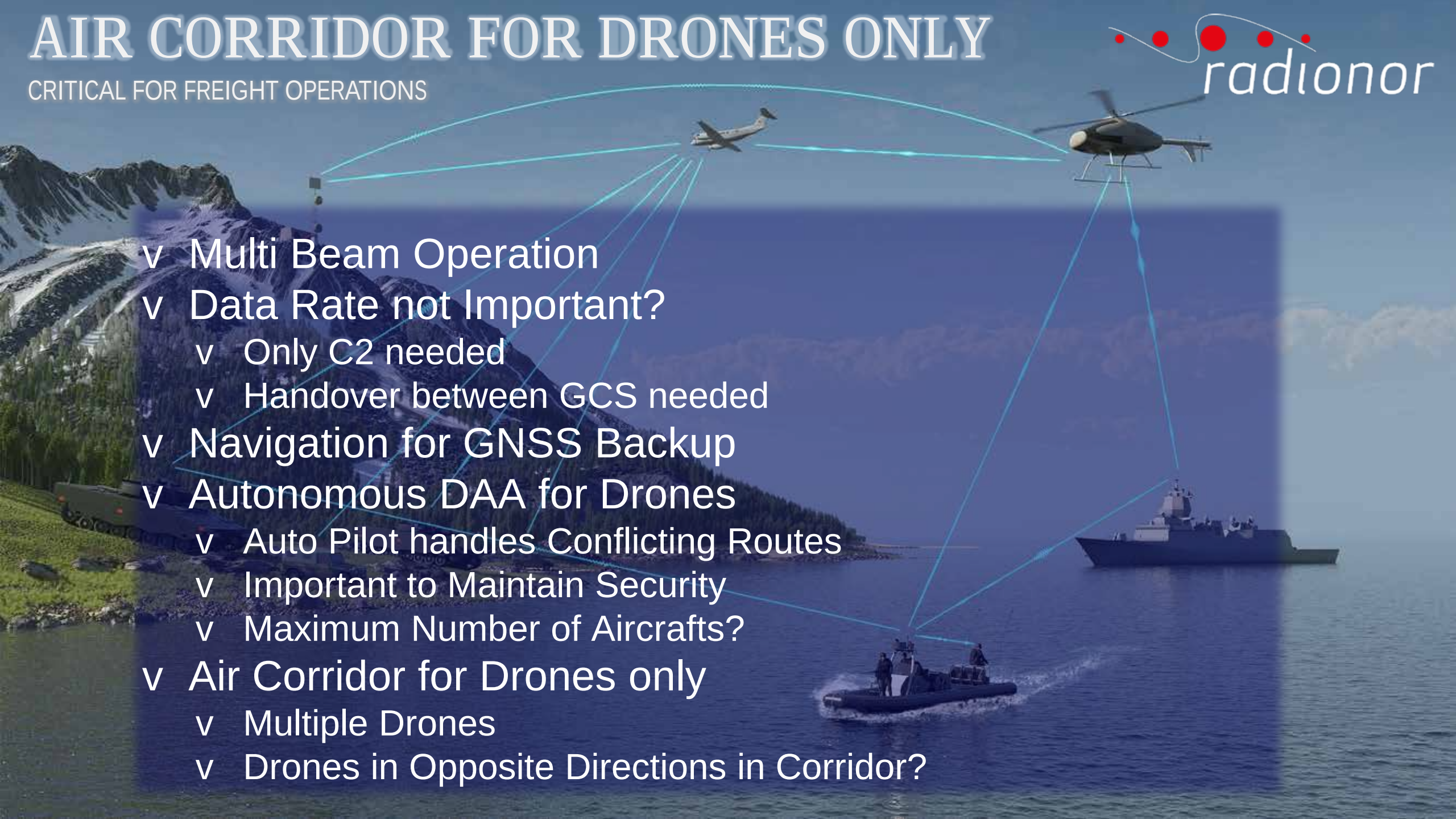
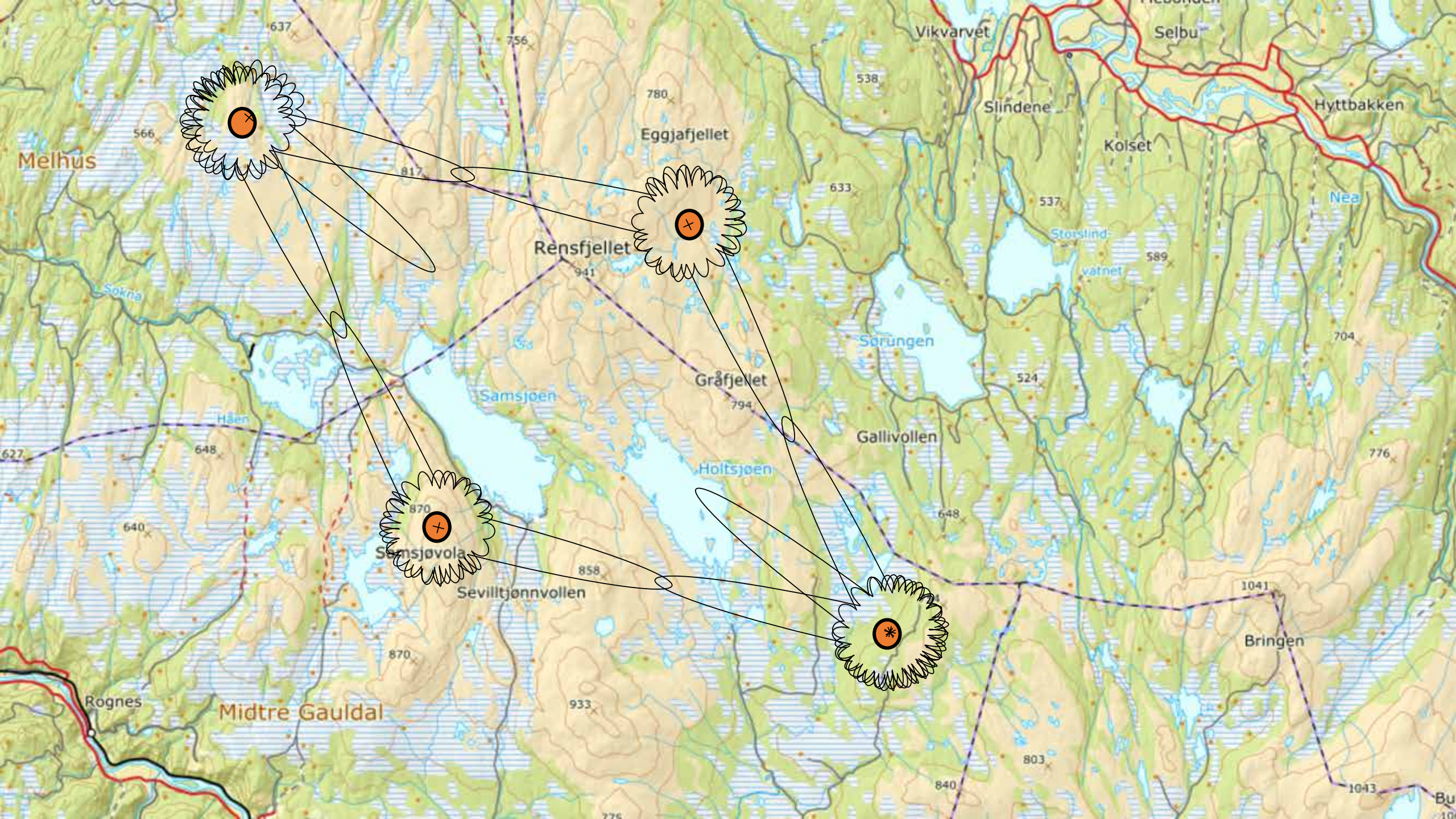


- Multi Beam Operation
- Data Rate not Important?
  - Only C2 needed
  - Handover between GCS needed
- Navigation for GNSS Backup
- Autonomous DAA for Drones
  - Auto Pilot handles Conflicting Routes
  - Important to Maintain Security
  - Maximum Number of Aircrafts?
- Air Corridor for Drones only
  - Multiple Drones
  - Drones in Opposite Directions in Corridor?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Holtsjøen
Gallivollen
Sørungen
Vikvarvet
Selbu
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Sokna
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Sevilltjønnvollen
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Midtre Gauldal
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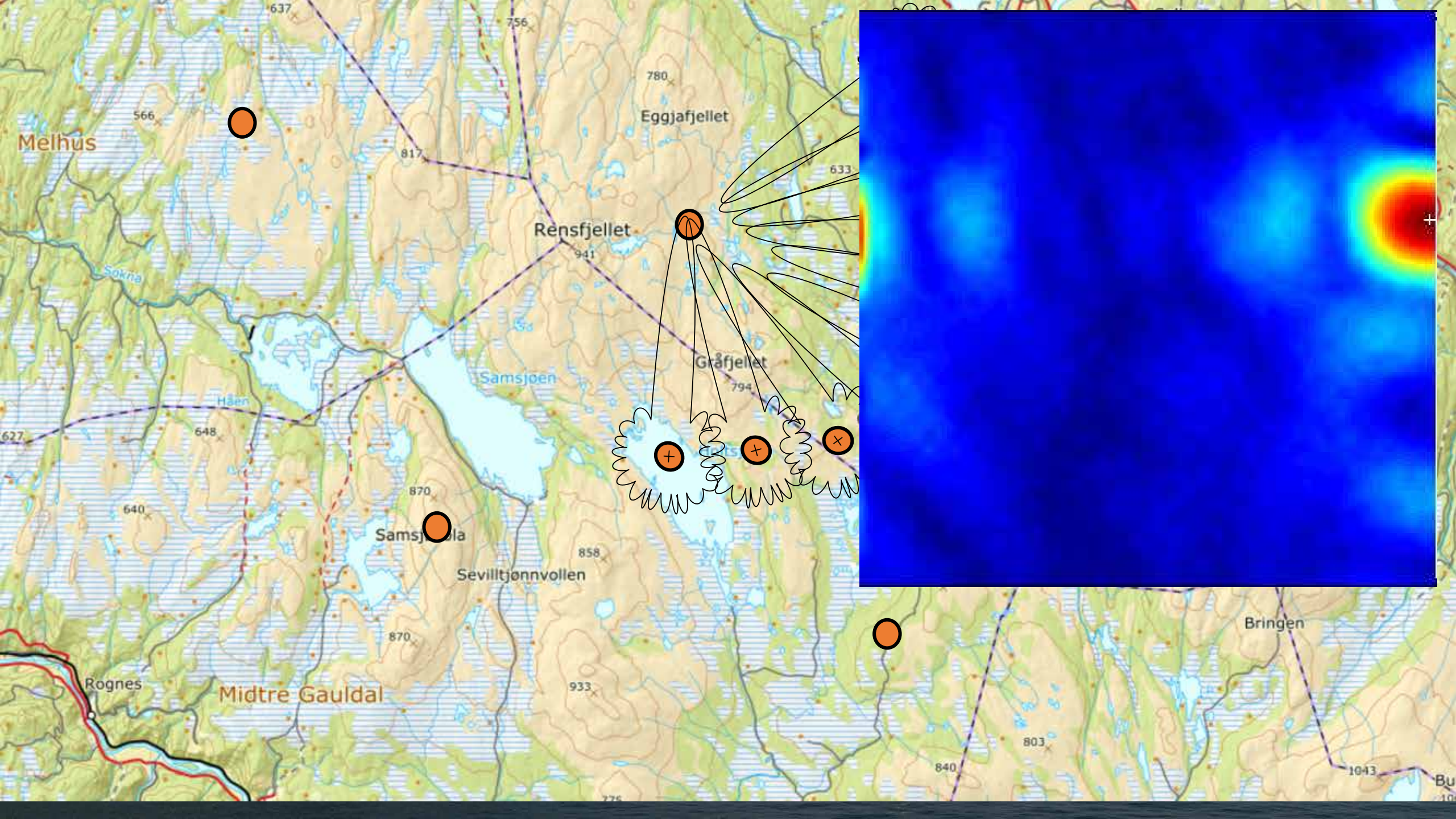
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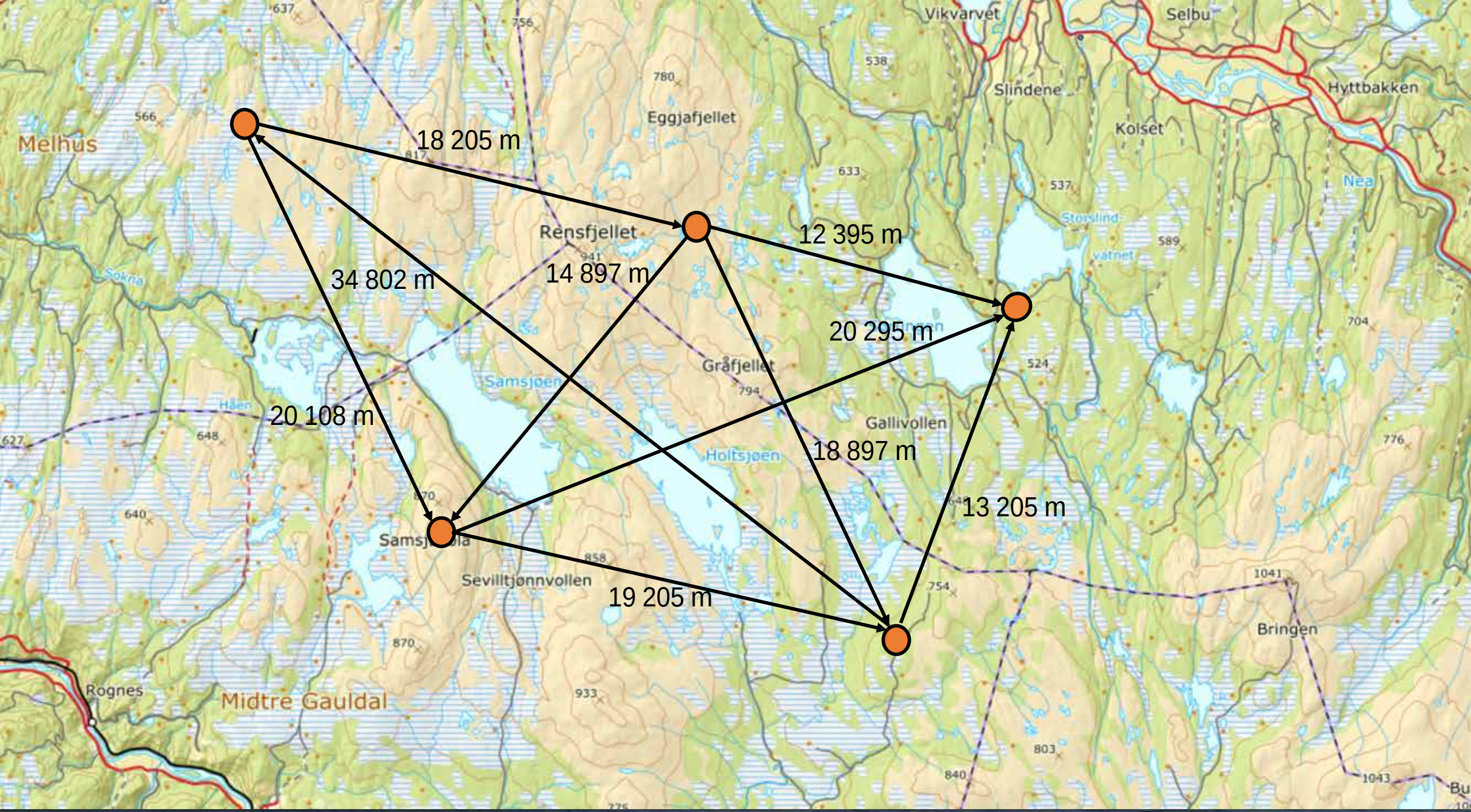
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14 897 m
12 395 m
20 295 m
20 108 m
18 897 m
13 205 m
19 205 m
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Rensfjellet
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Holtsjøen
Gallivollen
Sevilltjønnvollen
Vikvarvet
Selbu
Slindene
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Storslind
Bringen
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Midtre Gauldal

NAVIGATION

First BLOS flight using only PARS for positioning

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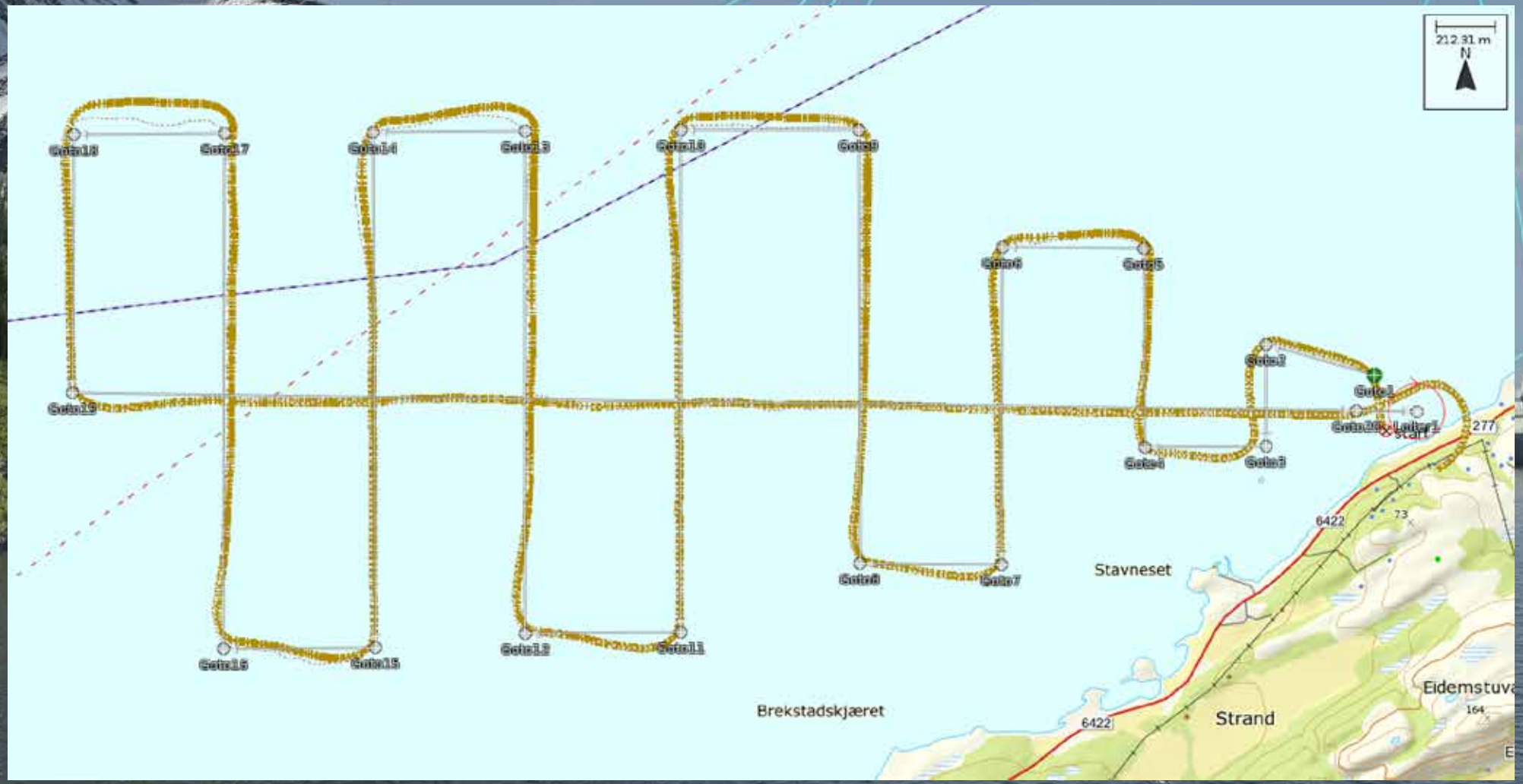
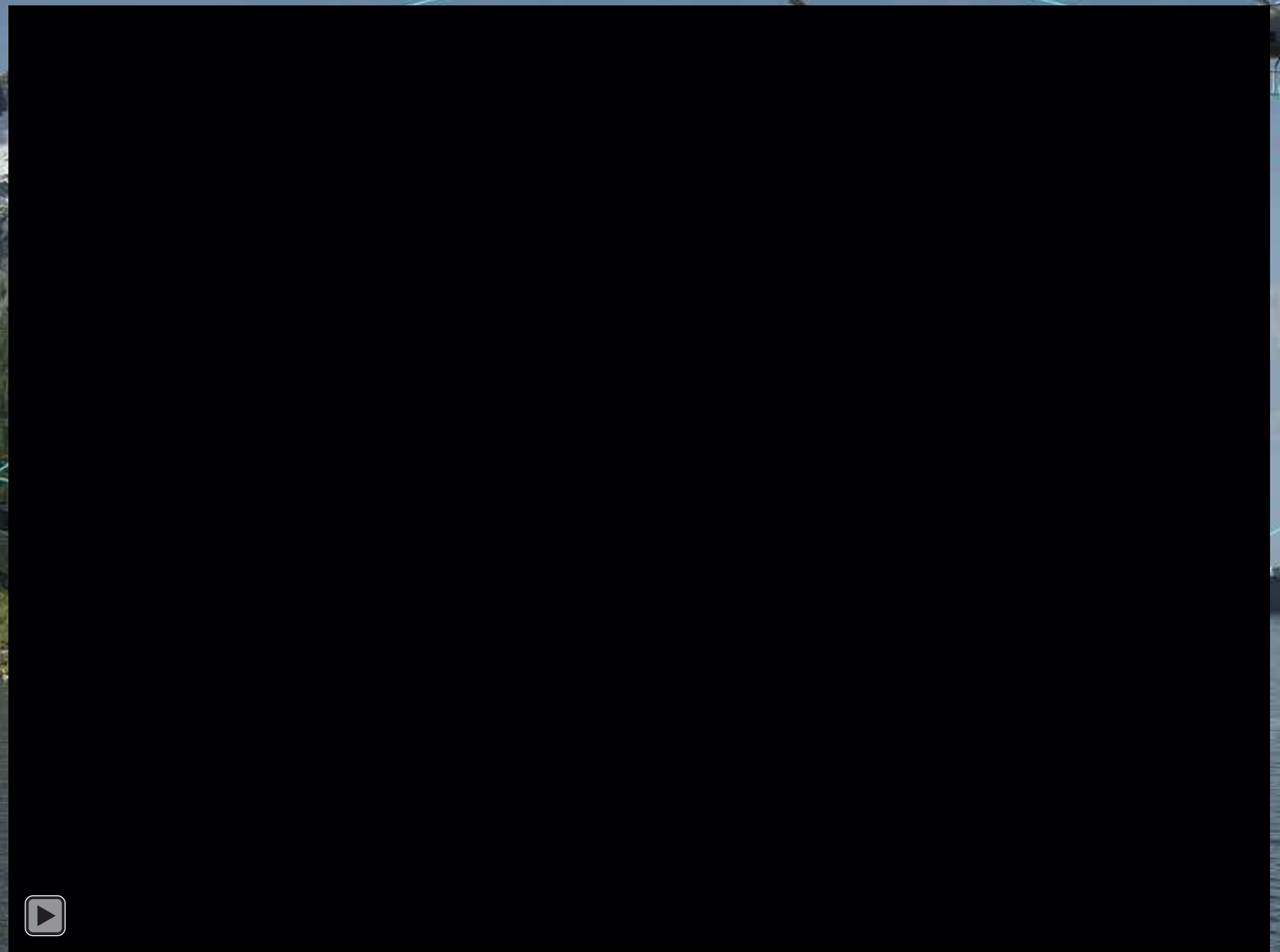


CORDIS ARRAY USED IN POSITIONING



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LN-0030OB
DANGER

CRE2-179-UAV


CRE2-144-LW


CRE2-179-UAV


CRE2-179


CRE2-179-AM


NCI AGENCY
NIDIC
Defence Innovation Challenge winner
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