Air Intelligence Finland Oy
UAV ARCTIC 2016
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Yrjö Halttunen, Toni Rosendahl, Matti Lappalainen – AIF Oy
Lauri Valtman - Threod
Air Intelligence Finland (AIF)

- UAV/RPAS services for the critical services of the society
- AIF Ltd will begin during 2017 a service network starting from Finland and Estonia providing 24/7 services. Company will expand to other Baltic Sea countries.
- Throdd is a shareholder and Equipment is provided by them. The Autopilot-Simulation-Training system is operational system of the whole company
  - Electric and gasoline powered engines, fixed wing and multicopter equipment
- In the future also leasing and insurance

www.airint.fi
AIF - services

- Flying services for authorities and other demanding customers
  - Continuous surveillance
  - On-call services
  - Pre-scheduled
- Own cameras and sensors
- Sales and maintenance of Threod systems
- Joint services with eg. Environics or Aeromon
Today using 1. Airborne KX-8

- Robust detachable arms, Top/Bottom camera mounting, Battery Quick Change connector, Dual stage vibration mounting, Rain Dome/Weather Proofing, Redundant Propeller Flight Capability, Onsite maintenance feasibility, KIT & RTF options
- Helicopter weight 5.7kg
- Lift capacity max 7kg
- Setup time 5min
- Flight time 10-15min (max kuorma) – 75 min
- Frame footprint (prop to prop spacing) 81cm
- Cost ca 50.000 (Components configurable)
Today showing 2.

KX-4 MULTIROTOR

- KX-4 is a highly configurable and easy to assemble multirotor platform for surveillance, military and law enforcement missions.
  - Lightweight, modular design
  - Backpack-transportable
  - Rapid deployment
  - Fully autonomous or fly-by-camera flight modes
  - Powerful and fully stabilized dual EO/IR gimbal
  - HD video feed and on-board recording
  - AES-256 encrypted telemetry, imagery and voice
  - Handheld or Mobile Ground Control Station
  - Remote Video Terminal
  - STANAG 4609 compliant KLV metadata
Tänään esillä, EOS mini-UAS

EOS mini-UAS

Mini-UAV that brings tactical UAV capabilities down to mini UAV level.

EOS is a hand-launched and parachute-recovered electric mini UAV designed to deliver stable and clear imagery. EOS brings tactical UAV capabilities down to mini UAV level. Proudly tested and used in NATO ISAF and KFOR operations.


Threaded Systems Autopilot TSAP600

- Automatic takeoff and landing
- Automatic navigation between user-defined waypoints
- Real-time modification of waypoints
- Loiter modes
- Scan patterns
- Emergency contingency routes and landing areas
- Warning displays
- GPS, INS, GLONASS navigation

Ground Control Station

- Handheld GCS for UAV control
- Touch screen and joystick controls
- Live picture stream
- Remote Video Terminal

Remote Video Terminal

- Real time video and telemetry streaming
- Used in field, vehicle, command post
- Standalone unit with router or with a computer
Today showing, EOS mini-UAS
Single RPAS or an entire system

- Need today and in the future
  - Considerations for the single acquisition
- RPAS is almost always designed to be a part of a system
  - System(s) of all participants
  - Map/location Systems
  - Auto-Pilot
  - Training
Choosing a single drone

1. What environment are you planning to fly in?
   - Temperature range
   - Humidity, winds, etc.
   - Obstacles (Forests, mountains, buildings, etc.)
   - Disturbances (Radio towers, GSM antennas, WiFis, etc.)
   - Access before Take-Off

2. What specific requirements do you have concerning the drone?
   - Operating Altitude
   - Range from pilot
   - Flight time
   - Automatic flight mode features
   - Number of axles for gimbal
   - Single or dual operator

3. What payload are you planning to lift?
   - Weigh and Dimensions
   - Power supply of payload
   - Data links needed with the drone
Design your fleet - Fixed wing or multirotor RPAS

- Airborne time, range
  - Fixed wing: several hrs. tens or hundreds of kilometers
- Payload
  - Comparable in both
- Autopilot
  - Thread has the same for all; Training, map and simulation systems, communication components, power components etc
- Actions at the target
  - Noice
  - Camera targeting
  - Speed/sample taking
Compatibility

Thread C2 flow chart with RVT solution
Map system, map simulation
Auto-Pilot

Manual vs Autopilot - VLOS /BVLOS
- Manual
  - Exception
  - Ad-hoc, when no maps
  - Usually visual connection
  - Loitering-mode
- Autopilot
  - Adaptive
    • easy to operate
    • Safe (triple redundancy)
    • Compatible with simulation systems
    • Yhdenmukainen simulaatioympäristön kanssa with multiple sensors and datalinks
# Gyro Stabilized Dual EO/IR Camera Gimbal

<table>
<thead>
<tr>
<th>Dual EO/IR Camera Gimbal</th>
<th>Basic PAL / HSG2</th>
<th>Basic HD / HSG2</th>
<th>Shark 1 / HSG2</th>
<th>Shark 2 / HSG2</th>
<th>Shark 3 / HSG4</th>
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<tbody>
<tr>
<td>EO sensor</td>
<td>10x</td>
<td>30x</td>
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<td>EO resolution</td>
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<td>FLIR TAU2 640</td>
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<td>Class III, 1-4W</td>
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<tr>
<td>Video tracking and scene steering</td>
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## Gyro Stabilized Triple EO/IR/IR Camera Gimbal

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Further contact information

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