SkyOpener
Establishing New Foundations for the Use of Remotely-Piloted Aircraft Systems for Civilian Applications

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BVLOS flight
- linear infrastructure survey
- large-area survey
- delivery
- security
- forestry, agriculture, sea
- emergencies

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BVLOS flight

- regulation (EU):
  - EASA NPA/Commission;
  - U-space/SESAR
  - Eurocontrol RPAS ConOps

- safety:
  - mid-air collision (DAA)
  - harm to people
  - damage to property

U-space blueprint

- **U1 foundation services**
  - e-registration
  - e-identification
  - geofencing

- **U2 initial services (management of drone operations)**
  - flight planning
  - flight approval
  - tracking
  - airspace dynamic information
  - procedural interfaces with air traffic control
• funded by GSA within the H2020 framework (H2020-Galileo-2015-1)
• started 5/2016, ends 11/2018 (30 mo.)
• A ready to sell system for drone-as-a-service inspection, surveillance and monitoring missions: demonstrating U2 mission capabilities based on secure redundant communications, state-of-the-art GNSS, UTM assets.

general objectives

• Improvement of reliability and security of navigation systems used on RPAS. (Galileo/EGNOS)
• Integration of Satellite Communication to increase the reliability of the RPAS communication systems. availability: 80-90% → 99% (SatCom)
• Testing an ATM system dedicated to RPA VLL operations with interactive surveillance features - UAV Traffic Management (UTM)
general objectives (ctd.)

• Improvement of information processing and presentation on RPS to reduce the risk of human error (user interface)
• Testing the RPAS mission payload and software package for e-TOD services and linear surveillance operations beyond line of sight.
Boreal

- 420cm wingspan
- 5kg payload
- 10h endurance
- 70-130km/h

on-board mission computer system

- proprietary autopilot
- interaction RPA/RPS
- payload control and data storage
- real-time alarms
- communications
- GNSS management
command & control communication and data relay

- hot redundancy
- satellite communication (L- and Ka-band frequencies)
- mobile communication (LTE)
- VHF in close range

GNSS, including Galileo, EGNOS

- redundancy and improved accuracy
- guidance
- geofencing
- info for UTM
- georeferencing survey data
ground station with user-friendly interface

- mission planning
- geofencing planning
- authorization request
- flight-time control
- telemetry
- data exchange
- emergency handling
- mission data download
UTM services

INFORMATION
Increasingly complex
Airspace legislation
Local Regulations
No drone zones
Wildlife protection
Privacy areas
Densely populated areas

VALIDATION
Can I fly?
• Yes
• No, because ...

NOTIFICATION
Manual
Auto
Airport
Local authorities
Police

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U-space level 2
Sensors
- LiDAR
- Visible-spectrum camera
- Thermal IR camera

Data exploitation
- orthophotographs
- LiDAR (obstacles)
- hotspots
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Service provision
Perspectives, open issues

• demo flights in Switzerland by July 2018
• simplification of authorization process
• enhanced safety
• competitive costs, rapid provision
• new services (currently not aerial, or not possible or too expensive by manned aircraft)
• safety analysis, guarantees
• regulatory process