

Safe integration of drones

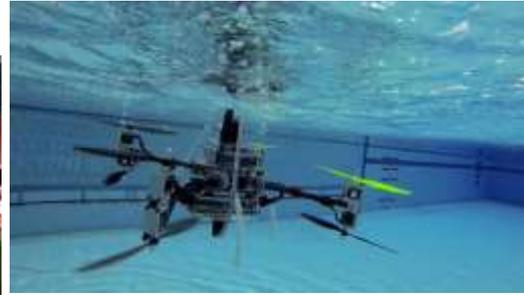


Inhoud

- Timeline
 - Class G
 - RPAS: CTR inner- and outer ring
 - RPAS: CTR Integrated and segregated areas
 - Unauthorised: Anti-/Counter drone measures
-
- U-Space & UTM

Is it a bird, is it a plane...

- Drone, RPA, RPAS, UA, UAS, UAV, UCA, RC/Hobby



Timeline

- **2015: Regulation remotely piloted aircraft systems (R-OABL)**
 - Professional use
 - In CTR max 45 meter (150ft) in 'outerring', inner ring prohibited for RPAS
 - CTR prohibited for model aircraft (unless special approval)
 - Class G: max 120 m, or 40/50 m, depending on licence and location
 - Specific distances from crowds, highways, railroads, buildings
- **2015: Regulation Model aircraft**
 - Use for recreation, sport or display
 - Class G max 120 m / 300 m / 450 m
 - Low flying areas: additional observer
 - Specific distances from crowds, highways, railroads, buildings
- **2017 implementation procedure CTRs EHGG, EHBK, EHRD, design procedure EHAM**
- **2018: EC / EASA Regulation on Unmanned Aircraft**
 - Open, Specific, Certified Categories; Risk Based approach
 - No-drone-, Limited-drone-zones (Red, Amber, Green airspace)
 - Max 120 m, model & professional UA

CTR Outer ring / inner ring

Procedure

- Two way radiotelephony, clearance required, ICAO flight plan;
- Mode S transponder required (Class C); waiver is possible if additional requirements are met and approved.

Implementation

- EHBK, EHGG, EHRD
 - Operational trials completed (OCT '17)
 - Implemented (DEC '17)
- EHAM
 - Start operational trial (FEB - AUG '18)

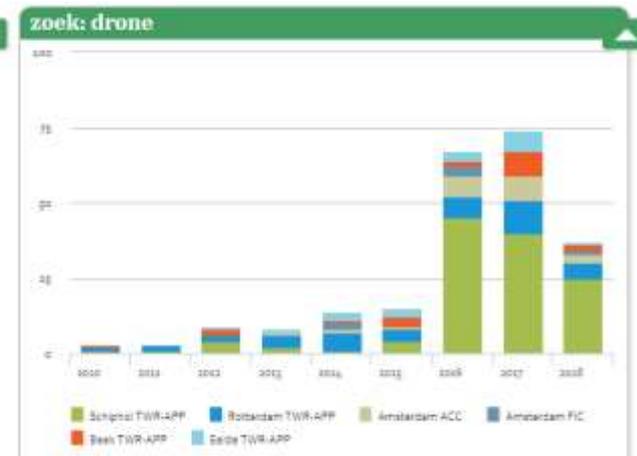
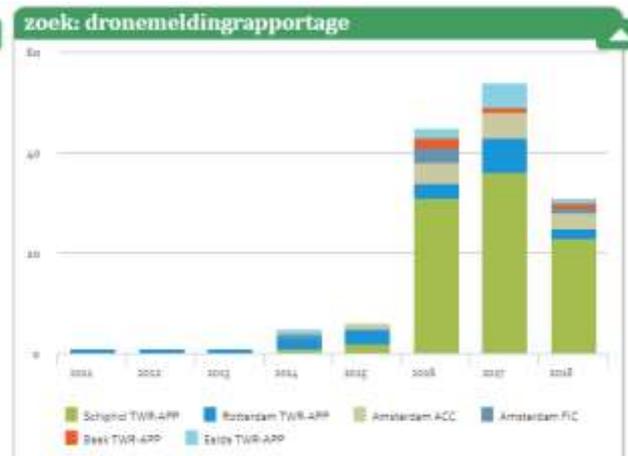


Anti-/Counter drone measures

SimpleMatrix

Unit: LVNL

		50%		66%		
	sep	< sep	=	sep	>=	eenzijdig
	<=	<	sep	>	>=	vooral
	50%	66%	100%	100%		
	A	B	C	D	E	
ATC direct	4	0	0	0	1	9
ATC indirect	3	0	0	0	0	0
Vliegers/andere	2	1	3	13	48	48
Geen (effectieve) oplossing	1	0	0	0	0	0



Anti-/Counter drone measures

- Unauthorized drones (hobby, recreation, terrorism) not detected by conventional surveillance
- LVNL OPS requested possibility for passive detection methods
- Measures available and in development, such as:
 - Drone radar Elvira (robin)
 - Passive detection based on datalink interception (42Solutions)
 - Cooperative detection based on datalink sharing (DJI Aeroscope)
- LVNL: advisory board EU EUROSTARS project 42Solutions



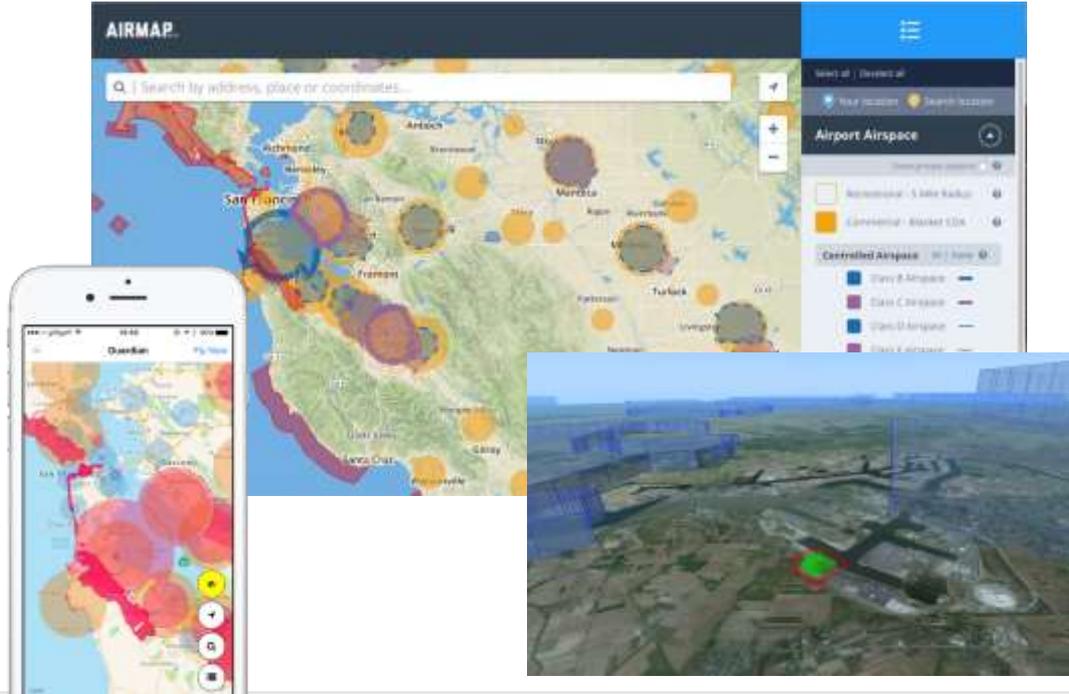
SESAR: U-Space



- U1 U-space foundation services** provide e-registration, e-identification and geofencing.
- U2 U-space initial services** support the management of drone operations and may include flight planning, flight approval, tracking, airspace dynamic information, and procedural interfaces with air traffic control.
- U3 U-space advanced services** support more complex operations in dense areas and may include capacity management and assistance for conflict detection. Indeed, the availability of automated 'detect and avoid' (DAA) functionalities, in addition to more reliable means of communication, will lead to a significant increase of operations in all environments.
- U4 U-space full services**, particularly services offering integrated interfaces with manned aviation, support the full operational capability of U-space and will rely on very high level of automation, connectivity and digitalisation for both the drone and the U-space system.

LVNL Drone Visie

SESAR U-Space: UAS Traffic Management (UTM)



AIRMAP

Next steps (2018/2019)

- Anti-/Counter drone detection system (KDC + 42Solutions)
- U-Space development and implementation:
 - Tender for UTM system at LVNL
 - SESAR Project CORUS (CONOPS for U-Space)
 - SESAR Project VUTURA (incl BVLOS)
 - SESAR Project PODIUM (Incl on drone detect and avoid systems)
- Remotely Controlled Cargo Aircraft (NAC)

Questions

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