

Agenda

- DroneRadar project history
- Conclusions from UTM vs Manned aviation challenges
- Mobile App (why education is so important)
- ANSP Perspective
- Example of 2way Non Verbal Communication Dynamic Airspace management
- DEMO
- Roadmap to UTM Croatia (proposal)
- What next?
- Who we are?



The DroneRadar project history

December 2015 DroneRadar official launch	September 2016	November 2016	April - July 2016	April 2017	May 2017	July 2017	Working on 3rd party interfaces
 Country wide promotion Internet Social media Bilboards 	 New CAA regulations Weight categories Flight definitions 	• EU Warsaw Declaration	DroneRadar integration with Military Airspace Management Unit (PL) and PANSA (Polish Air Navigation Services) 4 TWR and 2 FIS Regions	 Establishing cooperation with HEMS Dynamic Airspace management implementation 	 Beginning of test phase for engaging the Drone Pilots by Police and SAR The U-Space national support program (Żwirko i Wigura) is launched 	• DroneRadar award "European Drone Hero (Brussel)"	 "Geofencing" AaaS End-to-end UAV flight managemnt ADS-B (in, out) with Aerobits UTM Interconnects Integration with Drone Detection and elimination systems
		ALL MARKEN		droporadar		DR DR NE HERO EUROPE 2017	33 000+ downloaded applications

New tech, trackers, ADS-B, LTE, Bluetooth? With full responsibility NOT TODAY!

Who will certify those?



(TECHNICAL aspect) UTM vs Manned aviation challenges





Localization	VOR, ADF, DME, ILS, PBN* +gps	GPS
Altitude	Barometric sensor	GPS (w/o guarantee)
Visibility	Radar, transponder A, C, S, ADS-B	Trials with LTE + ADS-B
Restriction information's	AIP, NOTAM, AUP	+ Geofencing
ATS – Pilot communication	Radio VHF, CPDLC**	2 way non-verbal communication

* Newest systems

** VHF cannot be used by Drone pilots (antenna height, permission to use the aircraft radio systems, etc...)



So, what today?

Procedural kind control, While performing POCs on new technologies like e-identification, ADS-B, Barometric BVLOS flights



The DroneRadar ecosystem





- 3 lights, advice about possibility of the flight at given place and time
- User, without any aviation knowledge become familiar with all necessary aeronautical knowledge and regulations
- App allow flight registration (Check-In)
- DroneRadar is a frontend to all UTM Services, like Drone Registration DB, Geofencing, education, and many others...
- Basic App (always) Free of Charge
- what3word integration

ANSP



- Secure, web based console, with set of predefined user rights, tailored to ATS needs (TWR, FIS, AFIS)
- Console allow 2way "non-verbal communication" between ATS and RPAS (operator) with the use of a notification of requests for flights, start/end times, loss of control and emergency situations



Backend & Interfaces



- AaaA (Airspace as a Service)
- Drone Registration
- E-Identification
- Operations (e.g. HEMS integration)
- Active Geofensong
- Other ANSP for Drone tourist activities

Effective way to communicate with Drone society

DRAI DroneRadar Airspace Information



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🕑 Info	>>> 🕈	K Back	DRAI	
Local airspaces up to 30m (9	98ft) AGL:	DroneRadar Ai	rspace Informatio	n
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③ ○ ○ ● TMA	>	Miejsca Pam Muzeum Ausc informacii	ięci wymagają hwitz-Birkana na	zgody u. Więcej
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Kp Index : 1- Source: gfz-potsdam.de		Auschwitz-B permission. http://ausc	irkenau alway More informa hwitz.org/dro	s require tions at: ny
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Latitude (DD): 50.040935 Longitude (DD): 19.174919 Latitude (DMS): N50°02'27" Longitude (DMS): E19°10'30"		+4833844805 1947-08-01 14:08 CET status: act	<u>8</u> 15:08 CEST - ive	2019-12-31
what3words : gulp.mindsets.handprint 30m (98ft) AGL = 261m (85 AMSL Calculated elevation (SR7 m	57£t) FM) : 231			
	000		- 19	000

Change	DroneRadar	Airspace	Information	
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Name:	Obszar Miejsca Pamięci Auschwitz-Birkanau
Phone:	+48338448058
Registry:	MIEJSCE PAMIĘCI I MUZEUM AUSCHWITZ
Started:	Date: 1947-08-01 Today (∰ Time: 2110433 Now (⊘
Until:	Date: 2019-12-31 Today (mm) Time: 225959 Now (⊘
Note:	Loty nad obszarem Miejica Pamięci wymagają zgody Muzeum Auschwitz-Birkanau. Więcej informacji na http://auschwitz.org/drony Flying Drones over Memorial and Museum of Auschwitz-Birkenau always require permission. More informations at: http://auschwitz.org/drony







DroneRadar app (Multilanguage support)





ANSP perspective



What traffic controllers says about DroneRadar

- Two Way non-verbal communication is extremely useful, however requires changes in the law and ANSP operational procedures
- Extremely user friendly interface
- Use of DroneRadar, facilitates communication between ATS and UAV operator
- ATS noticed educational character of DroneRadar and increasing awareness even among amateur UAV operators
- By one click ATS can send request to land in certain area (CTR or self defined)
- DroneRadar is a powerful solution with multilevel user privileges mapped into different roles (FIS, TWR, Millitary, SAR)
- Intuitive use
- DroneRadar significantly reduce communication time and errors between ATS and UAV operator (to absolute minimum)







UTM end-to-end, two-way non-verbal communication platform



2-way non-verbal communication is in use on 4 controlled airports in Poland since Jul 2017

Partnering with Drone manufacturers we deliver:

- Mission Planning for evaluation of the terrain and airspaces
- Management for flight approval workflow
- Emergency situation where Fail Safe mode can be <u>remotely invoked by ATS</u>



Role of education in reducing number of incidents based on ECCAIRS



- ✓ 33000+ downloaded apps
- ✓ 96% of certified Drone Operators in Poland are using DroneRadar



Two way non-verbal communication

real usecase

