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REGULATORY AGENCY FOR ELECTRONIC COMMUNICATIONS AND POSTAL SERVICES

# Unmanned aircraft challenge for regulators

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# Drones
# - introduction-

**Drone**:

- Unmanned Aerial Vehicle (UAV)
- Unmanned Aircraft Systems (UAS)
- Remotely piloted Aircraft System (RPAS)

Controlled and steered either remotely or autonomously by embedded software and using sensor and GPS data.

Everyone may buy and use a drone, but under conditions:

A drone has to be made in accordance with relevant standards and can be used as prescribed by relevant rules and laws!

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# Drones
## - security risks -

**Accidents:**
- **Impacts**
- **System mistakes/Loss of control**

**Identity theft and obstruction:**
- **Control signal interference**
- **GPS signal jamming**

**Privacy/data theft:**
- **Privacy breach**
- **Unauthorized data access**

**What makes the use of drones risky?**

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# Drones

## - technical characteristics -

- Highly dynamic;
- Relatively small;
- Remote control and command /autonomous;
- Versatile and sophisticated sensors;
- **Radio interface:**

Intended threats and

**Unintended threats (RF harmful interference)!**

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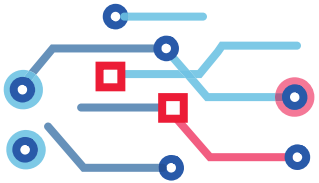
# Drones

## - regulatory framework -



- Legislative bodies: EC (European Commission) and national
  *(directives, recommendations and laws);*
- Regulatory civil aviation administrations /ICAO, EUROCONTROL, EASA and national
  *(keeping records, categorizations, issuing flight and pilot licenses, etc.);*
- Regulatory electronic communications agencies: ITU, CEPT and national
  *(RF spectrum management);*
- Standardization and certification bodies: ETSI, REDCA and national
  *(standard publishing and radio equipment certification procedures);*
- Inspection /ADCO, national inspectorate bodies
  *(RF spectrum and radio equipment control with appropriate sanctions).*

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# DRONES

## - international regulatory activities -

- ETSI – publishing various standards on SRD radio equipment;
- CEPT- workshop on rf spectrum for drones / 29 - 30 may 2018;
- ITU
  - Presentation: “Summary, Outcome, Aps for ongoing activities”

  Thomas Weber (ECO) regional workshop

  *Development of modern radiocommunications ecosystems* in St. Petersburg, 6-8 jun 2018;
  - Workshops on drones advantages in economic development

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# DRONES

## - international regulatory activities -

- CEPT

- published ECC Report 268 on technical and regulatory aspects of drones;

- formed Correspodence Group “CG Drones” within WGFM#88 with task to write a new ECC report.

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# Drones
## - international regulatory activities -

CEPT – new ECC report:

- Using drone subsystem for command & control, bandwidth 1-3 MHz in **1900-1920 MHz and 5000-5010 MHz** bands for commercial purposes;
- Using drone subsystems for command & control and data acquisition or payload system, bandwidth more than 10 MHz related to data in **1880-1900 MHz** and **1900-1920 MHz** bands for state institutions and administration purposes;
- Using drone subsystems in **2300-2400 MHz** band for both purposes;

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# DRONES
## - RF spectrum regulation -

| DRONES | REGULATION FRAMEWORKS |
|---|---|
| Amateur drones | SRD regulations |
| Professional drones | MFCN regulations |
| Professional drones | Video PMSE regulations (temporary individual authorization) |
| Professional drones | PMR regulation |
| Professional drones | Assigned bands (temporary individual authorization) |

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# Drones
## - RF spectrum bands -

| BANDS | COMMENTS on usage | Shared with |
|---|---|---|
| 1880 - 1900 MHz | for state institutions | DECT |
| 1900 - 1920 MHz | for state and comercial purposes | MFCN BS iznad 1920 MHz |
| 5000 - 5010 MHz | for LoS drones of low power | Gallieo ground-to-space link |
| 5030 - 5091 MHz | for certified drones by civil aviation administrations | |
| 2300 – 2400 MHz | covered by MFCN and video PMSE regulation | |
| 5150 – 5925 MHz | covered by SRD regulation | |
| 5875 -5925 MHz | almost impossible but under investigation | ITS systems for road infrastructure |
| 2010-2110, 2200-2500, 7000-8500 MHz | covered by MFCN and video PMSE regulation | |

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# Drones

## - Harmonized RF spectrum bands -

**(1) Commission Decision on SRDs, Short-range devices (2017/1483/EU):**

- 26.957-27.283 MHz
- 433.05 – 434.79 MHz
- 863 – 870 MHz
- 2400 – 2483.5 MHz
- 5725 – 5875 MHz

**(2) ECD on PMSE (2016/339/EU)**

- 2010 – 2025 MHz

**(3) Commission Decisions on terrestrial systems capable of providing ECS (2G, 3G, 4G, 5G)**

- 1140 MHz harmonized spectrum in EU
- Allocation in mobile telephony bands: 1800 MHz; 2 GHz; 3.6 GHz
- Allocation in mobile telephony (except aeronautical): 700 MHz, 800 MHz, 900 MHz; 2.6 GHz

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# Drones
## - standards -

| List of harmonized standards | | |
|---|---|---|
| 2.4 GHz | EN 300 440-2 V1.4.1 | Electromagnetic compatibility and Radio spectrum Matters (ERM); Short range devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive |
| 2.4 GHz | EN 300 328 V1.7.1 | Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive |
| 2.4 GHz | EN 300 328 V1.8.1 | Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive |
| 5.8 GHz | EN 300 440-2 V1.4.1 | Electromagnetic compatibility and Radio spectrum Matters (ERM); Short range devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive |
| 5 GHz | EN 301 893 V1.7.1 | Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive |

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# Drones
# - inspections -

7th joint cross-border R&TTE *market surveillance* campaign (2015) on RPAS
Final report adopted by ADCO R&TTE;

Conclusions after *market surveillance* procedure:

- 16 countries, 79 products;
- 92% radio devices do not comply with regulations (standards);
- 4 out 5 (82%) are not in accordance with R&TTE Directive;
- 51% radio devices do not use RF spectrum efficiently as possible,
  main reasons are:
  - spurious emissions (70%) and
  - power radiation overrun (23%).

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# Drones

## - RATEL -

- Regulatory agency for electronic communications and postal services
  in 2014-2018 issued 6 Certificates of Conformity for drones;
- „Kvalitet“ a.d. from Niš
  in 2015–2018 issued 35 Certificates of Conformity for drones;

There are much more drones on the serbian market!

RATEL inicialized the reduction of list that specifies radio devices that requires CoC when imports.

Drones are kept on the list!

RATEL inicialized coordination with all relevant institutions with intentions to enforce market survellience.

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# Drones
## - information -

**Interesting possibility for regulators:**

**Monitoring RF spectrum by using drones!!**

**THANK YOU**