Spectrum for drones

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Outside of current CEPT's work

Drones certified by Civil Aviation authorities

⇒ Aeronautical mobile frequency bands

Within current CEPT's work

Non-certified drones

- ↳ non-professional via SRD regulation
- ↳ professional via MFCN
- ↳ professional via PMR
- ↳ professional via video PMSE regulation (temporary individual authorisation)
- ↳ professional via a dedicated band (temporary individual authorisation)

Non-professional drones via SRD regulation

- Such as toys
- Use of current SRD regulation, in particular:
  - ERC/REC 70-03 Annex 8 (emphasis on the 35 MHz band for flying models)
  - WiFi in the 2.4 GHz band
- See Explanatory paper FM(18)059Annex037 www.efis.dk/documents/79124
- Reminder: WiFi in the 5 GHz bands (5150-5725 MHz range) as per ECC/DEC/(04)08 is not allowed for drones!

Professional drones via MFCN

- Main focus of the market
- For control-command and optionally data acquisition
- Three points of attention:
  - MFCN coverage in the air (low altitude)
  - MXA bands → why this restriction ? which consequence ? (in particular at CEPT borders)
  - 2.6 GHz bands, FDD and TDD: coexistence with radars in 2.7-2.9 GHz
- Studies are on-going within PT1

Professional drones via PMR

- Professional drones via PMR are similar to via MFCN
- But more local and the user may be the PMR owner
- No investigation required within CEPT at this stage

Professional drones via video PMSE regulation

- Temporary individual authorisation regime
  - as video PMSE
- For control-command and data acquisition
- Relevant video PMSE tuning ranges:
  - 2010-2110 MHz
  - 2200-2500 MHz
  - 7.0-8.5 GHz
- To be investigated

Professional drones via a dedicated band

- Is there a market demand ?
- But high interest for governmental drones

- Professional drones
  - Priority to control-command
  - Data acquisition requires more spectrum, thus making the identification of dedicated band for that purpose impossible
  - Temporary individual authorisation regime

- Governmental drones
  - Control-command and data acquisition

- Several bands considered by the CG Drones
  - *to be continued*

Band	Proposal	Coexistence issue
1880-1900 MHz ✓	Not considered yet by the CG Proposal for governmental drones only	Coexistence with DECT* should be fine: very local and very punctual use
1900-1920 MHz ✓	To be investigated for professional and governmental drones	Coexistence with MFCN BS above 1920 MHz, similar to professional drones via MFCN

* see Directive 91/287/EEC

Band	Proposal	Coexistence issue
5000-5010 MHz ?	e.g. for low-power LoS drones To be investigated?	In particular Galileo ground-to-space link: power restrictions foreseen. Footnote 5.443AA doesn't apply to drones controlled by a ground base station.
5030-5091 MHz ✘	Band only for certified drones ⇒ No possibility	
5091-5150 MHz ✘	No possibility	Aeronautical telemetry and AeroMACS in the band

Band	Proposal
2.3-2.4 GHz –	Covered by “via MFCN” and “via video PMSE regulation” No specific investigation required
5150-5250 MHz –	Covered by “via SRD regulation” No specific investigation required
5875-5925 MHz ✘	No possibility with road ITS and CBTC in that band

Spectrum for non-certified professional drones

- Main target on “via MFCN” (PT1 studies starting)
- Investigate “via video PMSE regulation”
  - 2010-2110 MHz, 2200-2500 MHz, 7.0-8.5 GHz
- Two or three dedicated bands to be investigated

Band	**Usage**	**Data**	
1880-1900 MHz	governmental drones	control-command + data acquisition	
1900-1920 MHz	professional drones	priority to control-command, temporary	market demand to be confirmed
	governmental drones	control-command + data acquisition	
5000-5010 MHz	professional drones	control-command only, temporary	preliminary investigations required

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Spectrum needs for professional drones

- Control-Command: 1 MHz to 3 MHz
- Data acquisition (mission-critical): up to 10 MHz or more, depending on the payload to be transmitted
- Additional regulatory and administrative needs (e.g. identification) remain to be quantified, likely < 1 MHz