Explanatory paper[1] related to Non-Professional UAS Use under General Authorisations

1. INTRODUCTION

Unmanned Aircraft Systems (UAS), also very often simply called 'Drones' technology has gone through massive development in recent years, and the market for civil UAS shows exponential growth, similar to all other significant new technologies. There is a number of challenges in fully realising the potential for growth that UAS bring with them. One of these challenges is meeting the spectrum requirements for UAS. Frequencies are used for command and control and identification as well as for payload transmissions (e.g. on-board cameras sending information to the ground). This explanatory paper has its focus on the non-professional UAS use operating solely under general authorisations (i.e. without any individual rights), also often referred to as license-exempt usage conditions.

2. FREQUENCY CONSIDERATIONS FOR NON-PROFESSIONAL UAS USE

Non-professional UAS use is considered to make use of frequency opportunities under general authorisations (i.e. without any individual rights). The most common use is found in the 2400-2483.5 MHz (ERC/REC 70-03, Annexes 1 and 3) and 5725-5875 MHz bands (non-specific use according to ERC/REC 70-03 Annex 1) under the current regulatory conditions set out in ERC/REC 70-03. Other usage opportunities exist in the 433 MHz and 863-870 MHz ranges. These usage opportunities are based on harmonised frequency use without restrictions (RE Directive Class 1 equipment) and use is only bound to the technical and operational conditions provided in the ERC/REC 70-03 and the EC Decision for SRD (2006/771/EC as amended).

There are also other frequency opportunities under general authorisation scheme such as for non-specific SRD or specific ones, e.g. ERC/REC 70-03 Annex 8 for model control in the 27 MHz, 35 MHz and 40 MHz frequency ranges.

The usage opportunities described above are provided on a non-interference non-protected basis. The frequency opportunities are based on shared, uncoordinated frequency use and UAS users have to take into account the possibility of receiving interference.

The use of 5 GHz WAS/RLAN as defined by ECC/DEC/(04)08 (and in 2005/50/EC as amended) is not allowed for UAS. WAS/RLAN is in this case defined as an application in the mobile service and the allocation is for the mobile service except the aeronautical mobile service. Currently, no derogation is in force within CEPT. The relevant class 1 equipment subclass 54 excludes therefore any usage between ground and aircrafts, and in analogy to this, also any use between ground and UAS. The use in 5150-5350 MHz is limited to indoor environments, and above 5250 MHz, the DFS mechanism is required. The detection and hence protection, of specific radar signals may not be ensured when the DFS is implemented on-board of a UAS application.

ECC Report 268 provides additional information on UAS that fly in circumstances where they do not need communications with air traffic control.

Additional information about radio equipment that can be operated without any restriction in EU, EEA and EFTA (class 1 radio equipment) is available in the EFIS.

UAS/Drones radio equipment used under license-exempt utilisation conditions shall especially comply with the respective radiated power limits as indicated in the following summary table.

[1] ERC Recommendation 70-03 refers to this explanatory paper in the introduction

Frequency band	Non-professional UAS/Drones	Reference	Background
Within 26.957-27.283 MHz, 34.995-35.225 MHz, 40.66-40.7 MHz	**OK**	ERC/REC 70-03 Annex 8 and also covered by ERC Decisions (01)11 and (01)12	Up to 100 mW e.r.p. 35 MHz especially for flying models
E.g. within 26.957-27.283 MHz, 40.66-40.7 MHz, 433.05-434.79 MHz, 863-870 MHz, 2400-2483.5 MHz, 5725-5875 MHz	**OK**	ERC/REC 70-03 Annex 1	In 26.957-27.283 MHz up to 100 mW e.r.p. In 40.66-40.7 MHz up to 10 mW e.r.p. In 433.05-434.79 MHz up to 10 mW e.r.p. In 863-870 MHz, up to 25 mW e.r.p., some dedicated frequencies also up to 500 mW e.r.p. In 2400-2483.5 MHz up to 10 mW e.i.r.p. In 5725-5875 MHz up to 25 mW e.i.r.p.
2400-2483.5 MHz	**OK**	ERC/REC 70-03 Annex 3	Up to 100 mW e.i.r.p.
5150-5250 MHz	**NO**	ECC Decision (04)08	**Not possible because of indoor restriction (see also Section2)**
5250-5350 MHz	**NO**		**Not possible because of indoor restriction + Operation while in motion may not allow a proper application of the DFS mechanism (see also Section 2)**
5470-5725 MHz	**NO**		**Operation while in motion may not allow a proper application of the DFS mechanism (see also Section 2)**

Summary Table