



International comparison of drone usage regulations

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Abstract

Nowadays nobody gets surprised to see a picture on a social media taken on an event or of a nice nature scene from an interesting perspective taken with a drone. However, the increase in popularity and quantity of drones requires regulations. Not only because of dangerous situations generated by a drone flying in a wrong place in a wrong time (like in the vicinity of airports) but also because it raises serious questions around data protection and privacy.

The subject of pilot-free flying vehicle is a very large one, thus in our paper we will study only the drones used for private, hobby and sport purposes, limited to remotely operated, weaponless flying vehicles equipped with a camera.

First, we will review the regulations used in the European Union, with a focus on the Hungarian regulations, followed by regions the regulations of which differ from the ones used in the European Union, such as the United States of America, Australia, Thailand and Russia. The main guidelines for regulation comparisons will be the weight of the drones, flying height and distance, as well as specifications of forbidden areas.

Finally, we will review countries in which the usage of drones in the airspace is completely forbidden.

Keywords: Drone, regulation, airspace protection, privacy, public safety

1 Preface

The development of electronic devices results in the need for new legislations and regulations on several domains. Due to their fast evolution, there will always be some areas of this industry the regulations of which will keep challenging the authorities.

The increasing number of pilot-free flying vehicles for civil or commercial use requires to set the limits and boundaries for their usage, thus, to protect privacy and private properties.

Nowadays most countries realize the importance of drone regulations and support the limitation of the usage of such flying objects as well as for their operators.

These regulations are even more important since these objects use the same airspace as other flying vehicles for transportation and other purposes.

It is important to emphasize the protection of individuals and their privacy, the need to avoid being able to fly too close to some buildings, people, events.

Thinking about public safety it is important that the drones should not be used as a weapon, should not be able to carry and drop down hazardous or hazardous-looking material.

2 Brief history of drones

One would think that drones are the result of the technical developments of modern times. As many developments, it has a history of several decades. Moreover, its development is far from being finished, it is still ongoing to propose always better and more modern drones on the market, easily accessible to private consumers.

As for most of the technical findings, the drones are originating from the military industry. Back to the end of the 19th century, the need to developing a flying vehicle without pilot sitting in it has been risen. The first written note about it dates from 1849, but of course at that time it was about a very rudimentary version and changes in wind and weather conditions mostly deviated them from their original destination. Such was the construction of the American version used in 1863 as well.

In the beginning from the 1900's this technology was in the focus of many engineers. The developments of this technology were sustained by the military and resulted in a solution where there still was need for pilot for takeoff, however later, during flight, the pilot could leave the aircraft.

Remote operation was introduced The Second World war. The explosives were mounted on an aircraft without pilot, which was operated from another aircraft, and they were all accompanied by a fighter plane. Yet the accuracy of this solution was still not satisfying.

The Cold War did not stop further developments, The American, Japanese, and Russian army kept working on remote operated flying weapons. A major change came during the Vietnam War where the American army used with high efficiency remote operated flying objects for night reconnaissance, signal disturbing and distribution of flyers.

Later, Israel - being in constant fear from attack - became the leader in research and development of remote operated solutions and became soon the supplier of pilot free flying vehicles for many countries including Russia, India, Great Britain, Germany, and Turkey¹.

In the 1990's drones used in the Yugoslav War were very useful for reconnaissance purposes, were equipped with high-end cameras and had an extended reach. In the 2000's such vehicles became one of the main weapons in counter terrorism.

Furthermore, the term 'drone' will be defined as per the generally accepted definition e.g. drone is an unmanned aerial vehicle² or vehicle system³ without a human pilot.

3 The ranking and regulation of drones in the European Union

About 8 to 10 years ago do use of drones for civil purposes had an extraordinary increase. The appearance of civil drones in such quantity resulted in serious new challenges for the lawmakers, since such remote operated objects are not only part of aerial traffic, but they are also generating many questions regarding data protection and privacy rights.

The first task was to define what is a drone, what are the subcategories and what regulations should apply to these subcategories.

In the European Union, the law of 2008 was replaced by a decree 2018/1139 of the European Parliament and European Council, entering in force in 20 days after its annunciation in all EU countries, including Hungary. This decree aimed the development and increased competitiveness of EU aerial circulation activity.

The fact that drones are using the same aerial space as other flying vehicles, and that the sale and usage of drones is a cross border phenomena, yet their purpose and use are differing makes this issue even more complex. Within the European Union every member state has the liberty to develop its own regulation system, since every country has his own risk level, and the adaptation of the regulations must be realized by local authorities.

Hungarian regulation is set by edict 4/1998. (I. 16.) section 1. § (3) about usage of aerial space. According to the regulation in force, drones do not need to have identification, thus their use for

¹ Dr. Palik Mátyás (szerk.): *Pilóta nélküli repülés profiknak és amatőröknek*. Budapest, Nemzeti Közszerzői Egyetem, 2013. 44.p.

² Unmanned Aerial Vehicles (UAVs)

³ Unmanned Aircraft Systems (UASes), amely nemcsak a pilótanélküli repülőgépet, hanem a kezelőszemélyzetet, a földi irányítóállomást, a szükséges adatkapcsolatot, illetve tartalékeszközöket is magában foglalja

sport or private purposes does not require a registration by the Pilot-free Flying Vehicle department of the Deputy Secretary of State for Traffic Affairs of the Ministry for Innovation and Technology. Such vehicles belong to an open category, within which three subcategories are defined: A1, A2 and A3. These categories are defined by the weight of the drones, and the pilots of such drones need to pass a drone usage exam in which they must prove their knowledge about the most important data security, aerial space limitation and flying security regulation. In case of drones below 250 grams only the information of basic regulations needs to be acquired, and most of the drones do belong to this category. There are some basic rules that every pilot must respect. The pilot needs to guarantee that the drone will not put any person in danger, that it will keep the required distances, that it will not fly above more than 120 meters except if it must overcome an obstacle, that it will not carry dangerous goods and that it will not release any material. Moreover, the pilots must know the specifications of its own vehicle and must perform a technical check-up prior to take off.

There are still ongoing negotiations between member states of the European Union about a unified regulation system, based on decree 2019/947 which contains the practical regulations, and although it is in force since the 1st of July 2019 the local application thereof should start only from the 1st of July 2020. The European Union is thus offering the required time for preparation for adaptation to the member states.

4 Outside the European Union

In the following section of our paper, we will study some countries and states outside the European Union, such as states from the American continent, Asia, Middle East, and Far East region.

4.1 United States of America

One would think that in the United States of America the legal background has a hard time to catch up with the fast IT developments. Just like in the European Union the states still have the freedom and authority to regulate with their own decrees the usage of drones, however there are some centralized rules that apply to all states.

Before flying drone in the United States of America, one must register it on the government website FAA DroneZone⁴, specifying the purpose of the drone usage as well as its technical specifications. Drones for hobby and pleasure purposes must be below 250 grams, drones above these weights are subject to different regulations. Although it may seem obvious, but the regulations specify that the drone cannot fly close to other flying objects, they must respect the basic regulations, and cannot fly in vicinity of high voltage power lines. In America except for territories with G⁵ classification, drones need to have an air space usage permit. And the drones always must stay within visual distance⁶.

4.2 Russia

The Russian civil flying authority allows the flying of drones; however, the regulation does not differentiate between recreational, hobby and industrial usage⁷. Whereas in most countries the industrial use of drones requires a special permit, in Russia there is only weight restriction. Drones below 250 grams do not need to be registered and above this weight they do.

⁴ <https://faadronzone.faa.gov/#/>

⁵ A légtér nemzetközi szabályozása A, B, C, D, valamint F és G betűkkel jelöli a különféle kategóriákat, az A és B osztályú légtérben a leghigorúbbak a szabályozások, a leghorúbban pedig a G osztályú légtérben mozoghatunk, azonban ez csak látás utáni repülést enged. Forrás: <https://legikozlekedes.com/2017/06/17/a-legterek-i-avagy-hogyan-szarnyaljunk-szabadon/>

⁶ UAV Coach: United States of America drone regulations. URL: <https://uavcoach.com/drone-laws-in-united-states-of-america/>

⁷ A rekreációs célú drónok a kellemes, szórakoztató időtöltést szolgálják (pl. versenyek, fényképek készítése), a kereskedelmi célúknak pedig valamely vállalkozás profitjának a növelése a célja. Forrás: <https://www.drone-made.com/post/the-5-differences-between-recreational-and-commercial-drone-flying>

Drones can be used during daytime in clear weather with good visual conditions, the flying vehicle must stay within visual distance, cannot fly above dense areas or above some specified habitats, military objects, or airports. Specific rules apply in Moscow to Kremlin and the Red Square above which hobby purpose drones are fully prohibited without a permit.

Russian authorities do not hesitate to react fast and to force to land almost without warning a flying vehicle operated from ground when they consider it is flying above some areas, events, or city centers being disturbing, by detecting them using their GPS signals.

4.3 Australia

Australian regulation slightly differs from the previous patterns in terms of weight of the drones as well as their use. According to Australia's Civil Aviation Safety Authority (CASA) it is legal to fly drones for recreational and commercial purpose in the Australian air, by using a very efficient regulation.

In Australia the focus was set on informing the civil society and offering them the required help, by creating an application which by determining the position of the pilot shows clear signs and comments on the regulations of drone flying in the given place and in vicinity of this position.

In areas marked with red color it is completely forbidden to use such devices, on orange areas one needs to pay special attention when flying drones, and around areas without marking one can freely fly drones. The application also contains the details of the regulations so the pilot can check them immediately before flying the drone. These being said, only drones for recreational purpose can be flown without a permit.

It is clearly set that one must keep a visual contact to the drone all the time during the flight, the drone cannot fly above 120 meters, the drone has to be kept at a distance of minimum 30 meters from people, must not approach temporarily rented airspace, privacy must be respected, at a given time one pilon cannot fly more than one drone, any crowd and gathering must be avoided. In case of drone of more than 100 grams control towers must be avoided by at least 5,5 km⁸.

4.4 Thailand

In Thailand there is a major differentiation between drones below and above 2 kilograms. Drones above 2 kilograms need to be registered at the Civil Aviation Authority of Thailand. Moreover, any drone equipped with a camera needs to be registered independently of its weight.

As a rule, drones cannot be flown closer than 30 meters to people, vehicle or construction areas, it cannot endanger others life, privacy and belongings. Its flying height must be between 30 and maximum 90 meters above ground. Airports and airport runways must be avoided by at least nine kilometers, and drone flights above cities any communities or gathering points is prohibited. In any case the drone needs to stay within visual contact distance, it cannot fly above clouds, and cannot carry dangerous goods. Flying above prohibited areas, danger zones, governmental buildings and hospitals require a special permit.

The violation of these laws results in serious repercussions, the punishment can be if one-year imprisonment, 40,000 TBH (cca. 1 000 EUR) or even the combination of both.

4.5 Japan

Japan was among the first countries in the world to introduce in 2015 regulations for use of pilot-free flying vehicles, however at the beginning these regulations were quite vague. After a small

⁸ UAV Coach: Australia Drone Regulations. URL: <https://uavcoach.com/drone-laws-in-australia/>

drone landed on top of Japan prime minister's office the lawmakers needed to rework these regulations. First, they determined areas above which the use of drones is prohibited.

Regulations are continuously reviewed and adjusted to the technical changes. As of today, without special permits drones can be flown up to maximum 150 meters above ground, it must be kept at a distance of minimum 30 meters from people, buildings and vehicles, drones must be kept within visual contact distance and can be flown only during daytime. Drones cannot carry dangerous or explosive material for example firework and no material can be spilled from drones, including liquids.

Flying of drones is prohibited above densely populated areas like cities, festivals, or events with many people. In Tokyo regulations are slightly different, 81 public parks and green areas are specified above which no drones can fly, independently of its size or weight⁹. An additional regulation of 2019 prohibits flying drones under influence of alcohol and drones are prohibited without permit in an area of 300 meters around Japanese and American military areas. Those who infringe the regulations are punished with serious penalties or even incarceration.

4.6 Mexico

In this country of the South American continent drones are differentiated by weights, drones below 250 grams do not require registration at the authorities.

In Mexico drones can be flown only during daytime, the drone cannot fly further than 450 meters from the pilots and must be kept at a maximum distance of 120 meters above ground. Drones cannot be flown in vicinity of people or animals, moreover it must stay away from historical sites except when the pilot has asked and received a permit from the related authorities beforehand to take video or photo shoots around these areas. Airports need to be avoided by at least 5 nautical miles which are about 9 kilometers. Drones must not let fall anything that can damage people or ruin one's possessions. It is important to be informed about the hotel's or accommodation's own drone usage rules before making a trip.

4.7 Iceland

The regulations in this northern island country are different from the ones we mentioned before. Drones for recreational purposes need to carry the name address and phone number of the pilot.

Above cities drones of maximum 300 grams can be flown and above rural areas vehicles of maximum 2500 grams can be sent into the air.

Maximum height of drone flights is 120 meters above ground or sea, safety distance from international airports is 2 kilometers, from buildings in cities 50 meters and from any other sites 150 meters, it must not disturb air traffic and must not get too close to any vehicle or boat.

Drones need to be kept within visual contact distance, and "the pilot needs to respect the basic directives for privacy and safeguarding"¹⁰.

5 Where prohibited or no regulations

Finally, we would like to mention some countries where pilot free flying objects are prohibited or where there are no regulations for these.

In Cuba the use of drones was never permitted and there are no plans for the near future to make any regulations for them, and that is why it is especially important for tourists to do their homework

⁹ Live Japan: Complete Guide to Flying Drones in Japan: Etiquette, Laws and Undersatnding No-Fly Zones. 2019.09.22. URL: <https://livejapan.com/en/article-a0003529/>

¹⁰ UAV Coach: Iceland Drone Regulations URL: <https://uavcoach.com/drone-laws-in-iceland/>

about conditions of traveling into the country and staying in the country before making the trip.

In Madagascar drones are completely prohibited, so if a tourist would like to enter such device into the country it will be most likely confiscated by the customs.

As of today, in Qatar the law says that only people of local nationality can fly drones but even they require a permit from the state.

In North Korea although there are some regulations regarding drones it is a general recommendation that such vehicles are better not used. The lack of regulations does not mean that drones can be used by anybody anytime and anywhere, as a matter of fact one should better be prepared to the contrary¹¹.

6 Summary

As we can see from the examples above questions about drones are rising in the whole world, there is a clear tendency to restrict the use of pilot free vehicle objects equipped with a camera.

There is clearly a pattern regarding the size of the drones, the safety distances from airports, the maximum of flying distance and sites where drones can be used freely, the respect of privacy is a basic requirement everywhere and we also need them to mention the protection of historical values.

The Australian solution could be an example, since thanks to the application within a couple of clicks all important information can be gathered by the pilots. We would consider important the introduction of sanctions, since regulations are of no use if their respect is left to the decision of the individuals, especially when we can observe an increasing number of delicate situations and misuse. Moreover, since the use of drones is not without risks, we would propose to consider the introduction of identification of drones by license plates which in case of recreational drones has not been introduced in any country yet. Finally, it could be useful to implement a general prohibition to flying drones under influence of alcohol.

In any case it is strongly recommended to gather enough information about drone usage laws and regulations in specific countries before making a trip there since changes in this area are to be expected soon.

In our next paper we will review legal case studies related to drone usage from Hungary and from the above-mentioned countries, showing the actual implementation of the theoretical sanctioning options.

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