



# Erasmus+

## Educational for Drone (eDrone)

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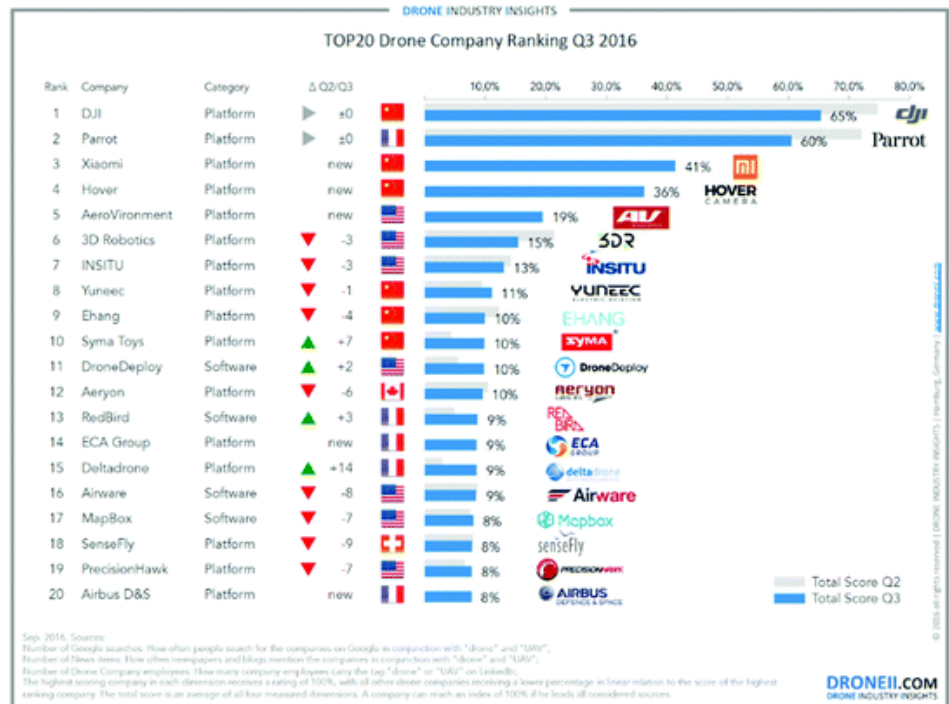
## INTRODUCTION / FOREWORD

It is well known that science is in a permanent development and emergence of new technologies takes place at an unimaginable speed. Currently we are witnessing projects that some decades ago seemed to be detached from science fiction movies. We can see the greatest ascents in the development of industrial machinery, military technologies, development of robots and artificial intelligence.

An eloquent example of the technology development is the emergence of unmanned aircraft or as it is widely called - Drones.

In the history Unmanned Aerial Vehicles (UAVs) have been around for centuries and were solely used for military purposes. The earliest recorded use of a UAV dates back to 1849 when the Austrians attacked the Italian city of Venice using unmanned balloons that were loaded with explosives. Although balloons would not be considered a UAV today, this was a technology the Austrians had been developing for months before, which led to further advancements. In 1915, British military used aerial photography to their advantage in the Battle of Neuve Chapelle. They were able to capture more than 1,500 sky view maps of the German trench fortifications in the region.

Development of complex devices started more "from the water than the air" and originates from the late nineteenth century when Nicola Tesla has built and demonstrated the first radio-operated mini-ship, which was not left unobserved by scientists from that period, constituting the first step in the further development of remote controlled technologies. The United States began developing UAV technology during the First World War in 1916 and created the first pilotless aircraft. Shortly after, the U.S Army built the Kettering Bug. While continuing to develop UAV technology, in 1930 the U.S Navy began experimenting with radio-controlled aircraft resulting in the creation of the Curtiss N2C-2 drone in 1937. During WWII, Reginald Denny created the first remote-controlled aircraft



Sep. 2016, Source:  
Number of Google searches: How often people search for the companies on Google in comparison with "drone" and "UAV".  
Number of News items: How often newspapers and blogs mention the companies in comparison with "drone" and "UAV".  
Number of Drone Company employees: How many company employees carry the tag "drone" or "UAV" on LinkedIn.  
The highest scoring company in each dimension receives a rating of 100%, with all other drone companies receiving a lower percentage in linear relation to the score of the highest ranking company. The total score is an average of all four measured dimensions. A company can reach an index of 100% if he leads all considered sources.

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called the Radioplane OQ-2. This was the first massed produced UAV product in the U.S and was a breakthrough in manufacturing and supply drones for the military.

Drones were previously known to be an unreliable and an expensive toy, but in the 1980's this attitude began to change. The Israeli Air Force's victory over the Syrian Air Force in 1982 contributed to this change. Israel used both UAVs and manned aircraft to destroy a dozen of Syrian aircraft with minimal losses. Further, in the 1980's, The U.S created the Pioneer UAV Program to fulfil the need for inexpensive and unmanned aircraft for fleet operations. In 1986 a new drone was created from a joint project between the U.S and Israel. The drone was known as RQ2 Pioneer, which was a medium sized reconnaissance aircraft.

More recently, in 1990 miniature and micro UAVs were introduced and in 2000 the U.S. deployed the Predator drone in Afghanistan while searching for Osama Bin Laden. Although many of the most notable drone flights have been for military purposes, technology is continuing to advance and receive more attention. In 2014, Amazon proposed using UAVs to deliver packages to customers and some real-estate companies are using drones to shoot promotional videos. The uses of drones will continue to grow in many industries worldwide

In this respect, there is an increase in the number of uses of Civil Drones in activities such as:

- Mapping and topography of the territory;
- Search and rescue operations;
- Agriculture;
- Delivery of the product;
- Aero photography;
- Inspection of communication networks (pipelines, high voltage buses, wires, etc.).

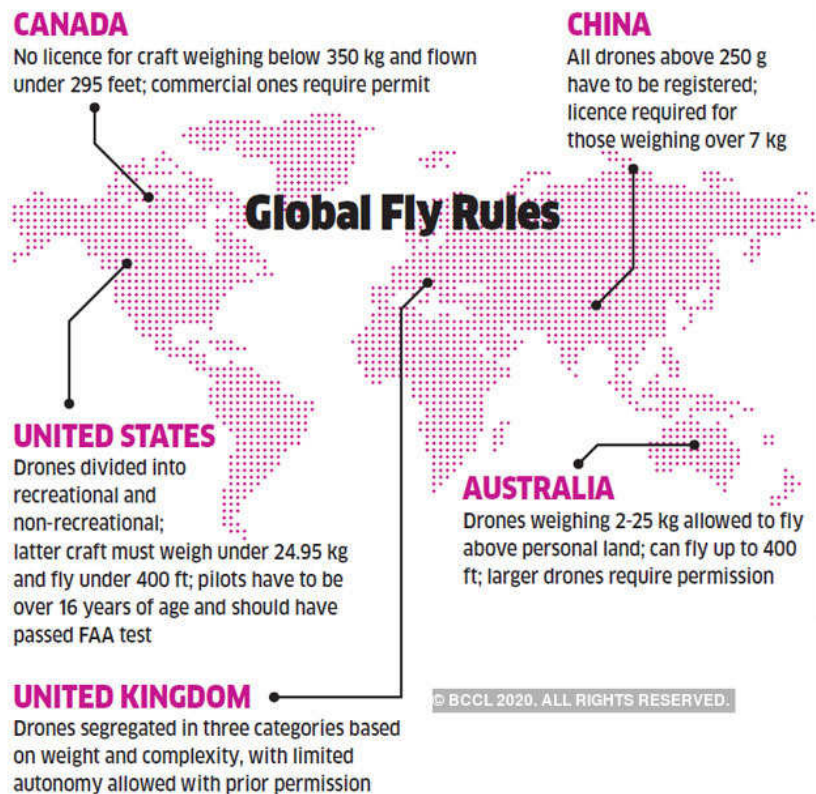
The advantage of using unmanned aircraft to the detriment of other devices is that these can save financial resources and can be used in places where the human being is practically impossible to be involved (natural calamities, fires, hardly accessible areas etc.).





Although the use of Drones in such activities brings a lot of benefits, but one of the major problems at the moment, internationally, regionally and nationally, is that there is not a clear and harmonized regulatory framework that would cover into the legal framework the air operations performed with such new type of the aircraft.

Currently, the international organizations such as the International Civil Aviation Organization (ICAO) and national aviation authorities undertake measures to regulate this field. Concerns of the states to regulate access at and the use of the Drones are based on the intention to ensure the safety of third parties who may suffer from their use, through measures that would ensure the flights safety of civil aircraft and aviation security, the life and health of human beings, privacy etc. On the other hand, it is necessary to create favorable conditions for drone users, so that this technology that we can rightly call a device of the future brings many benefits to the users and should not be used or be allowed under restrictions or requirements that are too strict.



For this purpose, the competent bodies shall take into account numerous criteria, including the dimensions of unmanned aircraft, the airspace zones in which they are used, the territory over which the flight is performed etc., and these requirements must be directly proportional to the risks presented by Drones for the people and good from the ground.

In this context, we shall analyze the practice of several states while developing the normative framework for the use of unmanned aircraft.





## State of Art of drones laws in Programme Countries







## European Union

In the summer of 2019, new EU regulations for using civil drones will be published. From the moment of publication, it will take one year before these new regulations come into effect. The new regulations aim to create a level playing field in Europe and will remove (most) drone operations from the aviation domain in terms of regulation. Current manned aviation regulations are rule-based and have proven to be insufficiently flexible for the rapid changing drone market. There is a concerted effort by the 32 state members of the European Aviation Safety Agency (EASA) to integrate UAVs into the continental airspace. At the same time, regulators from individual countries and drone manufacturers are working together to make sure the industry benefits from the unified legislation in terms of innovation, leadership and of course, sales.

The new regulations are risk-based and divide the operations, whether commercial or recreational, in a low risk category (open category) and a



medium risk category (specific category). The high-risk operations will remain in the (manned) aviation domain under the certified category (which is currently not addressed in the new regulations). The open category places very few demands on the pilot or operator and implies a buy-and-fly approach. Pilot qualification can be as simple as an online exam. The drones themselves will need to have a European approved product certification (CE marking).

A lot of current commercial drone operations will be possible in this open category as long as they do not take place over or near (30m) people. This will imply a heavy influx of companies of all EU member states wanting to use drones as a tool (rather than drone centric service operators). The inspection of wind turbine blades – which usually takes place far from people – is a good example of the type of operation that will be placed in the open class.





All other operations, unless high risk, are performed in the specific category. For this category a risk assessment must be carried out by the operator with associated mitigation measures implemented, and approval requested from their National aviation authority. To ease the burden for operators and aviation authorities, a number of so-called standard scenarios will be created that should cover 90% of all operations. In a standard scenario the mitigation measures are spelled out and the operator has to declare or demonstrate that it is compliant. An example of an operation in the specific class could be aerial mapping over a populated area.

The regulations miss a lot of detail such as the required standard scenarios. These standard scenarios are being developed in most EU countries in the hope and expectation that their version will be adopted by the EU. Unless strict control is exercised and harmonisation between member states is formalised, we are set for a couple of years of regulatory ambiguities, 'grey' areas, frustration and further delays.

A strong word of advice to anyone wanting to enter the industry is to obtain permits, privileges and exemptions at a national level before the new EU regulation enters into force. After the summer of 2020 that will no longer be possible and you risk getting stuck in a 'limbo' if the new regulations are delayed or not yet properly implemented.

## INTRODUCTION TO EU DRONE REGULATIONS

Whether you are a serious hobbyist or a drone professional you probably have heard that new EU based regulations for drones are on their way. These are expected to be published between May and July of 2019. If you try to read these, you will be quickly submerged in jargon, abbreviations and legal terms such as 'implementing and delegated acts'.

The title of this article suggests that the readers are dummies and that I am the expert on this matter... This is certainly not the case! The reason for writing this article is mostly that I didn't understand the regulations myself and needed some clarity. If you see any errors, or something that is not clearly explained please let me know and I will adjust accordingly.

Why are new regulations needed? Well if you have ever tried to apply for a permit to fly a commercial drone in Belgium, as a foreign operator, you will understand that this was (and still is) a bureaucratic nightmare, nor do I envy foreign operators trying to apply for one in the Netherlands.

The aim of the new regulatory framework is to standardise the operational regulations in Europe and create a common market.

## THE PROCESS

Without barely anyone noticing, the responsibility for the operation of **civil** drones in European airspace below 150 kg MTOM (**M**aximum **T**ake **O**ff **M**ass) was transferred from the National aviation authorities to the European commission on the 7th of December 2018.







Civil drones refer to all drone usage other than by the military, police or emergency services. They therefore range from hobbyists operating a DJI Mavic to cargo delivery.

EASA (European Union Aviation Safety Agency) has been appointed by the European Parliament to propose to the European Commission the technical expertise to regulate drones below a maximum take-off mass of 150 kg.

The proposed regulations by EASA have been unanimously accepted by the European Commission on the 28th of February 2019. These regulations are called the Implementing Act and are accompanied by the Delegated Act that was adopted by the European commission on the 12th of March 2019.

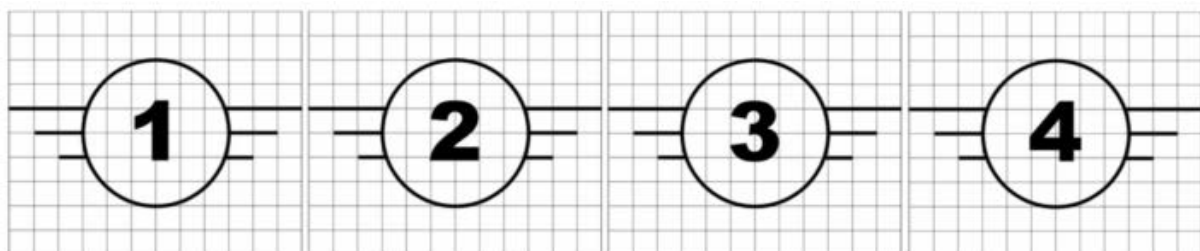
The Implementing Act is currently set out in two documents, the Commission Implementing Regulations and the Annex to the regulations. These set out amongst others the following:

- Different (sub)categories of UAS operations
- Rules, procedures, competency and minimum age for pilots
- Airworthiness requirements for the UAS
- Cross border operations
- Registration of UAS operators
- Tasks and designation of competent authorities

The Delegated Act also comes in two documents, the Commission Delegated Regulation and the Annex to the regulations. The delegated regulations cover amongst others the following:

- CE and operator markings on a UAS.
- Technical requirements per UAS category
- Obligations of manufacturers, importers and distributors of UAS
- Requirements on non-EU country operators
- Remote identification

In short, the real regulations can be found in the Implementing Act.



*Proposed markings for subcategory C1 to C4 UAS in the open category.*

These acts were sent to the EU parliament and the Council for the mandatory 2 months scrutiny period. If no objections are raised, then both acts will be published before the summer of 2019.





But the Delegated and Implementing Acts do not tell the full story. These are to be accompanied by guidance material. The reason for this being that by describing the exact details at a lower level in the guidance material, the regulations themselves do not need to be changed when a detail is adjusted. That sounds logical but, as with everything the devil is in the details, and the guidance material is not yet published.

The big question on everyone's mind is what this means for me as a drone producer, drone service provider or drone hobbyist and when will we feel the impact? The fact that this regulatory framework has been accepted by the European Commission does not mean that these come into effect immediately.

Now that feels like a contradiction. On one hand the responsibility for UAV operations below 150 Kg MTOM has already been transferred from National Civil Aviation Authorities to the European Commission. However, the National authorities still have to implement these regulations. This is due to the fact that, although these regulations will be valid for the whole of the EASA airspace, the national authorities still have the authority to determine the details, such as the specific airspace where drones cannot go, or which organisations can train and qualify drone pilots.

Between May and July of 2019, the new regulations will be published. The national CAA's then have one year to implement these regulations before these come into force in July 2020. Up until that date it is still possible to operate under the current regulations and even apply for a permit/exemption based on these regulations. From July 2020 onward it is still possible to use previously obtained permits and exemptions for a period of two years up to July 2022. From then on it is only the EU regulations that are applicable.



If you want to make use of the new regulations because they offer more flexibility than the current regulations in your country, you will have to wait until July 2020. Between July 2020 **until the end of the transition period in 2022 you will get the best of both worlds.**





## THE REGULATIONS

The new European Regulations will bring changes to whole the drone industry. The main gain is that it creates a European wide structure and uniformity in comparison to the current shattered and incomprehensible regulations that differ in each country. The regulations also give UAV pilots more privileges than in the past.

Local Civil Aviation Authorities still have some say in matters such as designating no fly zones or creating special zones with specific regulations. However, **the implementing act prevails over local regulations meaning that individual CAA's cannot make the rules stricter.**

Now what are these proposed regulations all about? The main change is that the new regulations are risk-based. This means that the risks of each type of operation and with different types of drones are evaluated. For example, flying a heavy drone over a populated area carries a far greater risk than flying a little hobby drone in a remote area. Only the location matters, i.e. **where you fly will be relevant but not what you do.**

Other main principles in the new regulations are:

- Rules are made at European Level
- Implementation is done at national level
- No differentiation between commercial or recreational use
- Regulations are a mix of product specifications and aviation regulations
- Drones in the open category must be CE certified (with the exception of self-build drones)
- Drones will be partially removed from strict aviation regulations in most countries
- Operators can be natural persons as well as legal entities
- There is no requirement for insuring a drone against molestation and hijacking in the open category (no joke, this is currently mandatory in the Netherlands).

The product specifications for drones have been introduced since technical developments of drones have progressed in such a rapid pace that legislation was no longer able to keep up. At present a new model drone replaces the earlier version at an average rate of 9 months. Compare this to manned aviation where this cycle takes around 7 to 9 years.

Under the new regulations, drone operations in the EU are subdivided into three categories:

1. In the **open category** operations can take place that are considered low risk and do not require prior authorisation.
2. In the **specific category** operations take place that considering the risks do require authorisation by a competent authority before the operation takes place. A risk assessment must be carried out and mitigation measures identified unless the operation is very common. In the latter case the risk assessment and mitigation measures have been previously identified and part of a 'standard scenario' which is approved by EASA.







- In the **certified category** operations take place that considering the risks require a certified drone, a licensed pilot and an organisation approved by a competent authority to ensure an appropriate level of safety.

The current proposed regulations do not cover the certified category. In this category the drones will have to comply with standard aviation requirements and the operational rules are the same as for manned aviation.

How does one know in which category the operation will take place? The simple answer is that any operation that is not considered as open category automatically falls into the specific category. If even the specific category cannot be applied (for example flying a drone with a MTOM > 25 kg) then these fall in the certified category.

The 'where' question will be addressed by the National Aviation Authorities. A one size fits all approach was not feasible so National Aviation Authorities get to say where drones cannot fly at all, where the open category is not allowed etc.

Interestingly enough, the regulations provide more freedom for the UAS operator in the fact that certain aspects have not been made explicit in the new regulations. For example, most countries in Europe would define VLOS (**V**isual **L**ine **O**f **S**ight) as the distance to which the UAS can be seen but to a maximum of 500 meters. This is also the maximum distance from the pilot that a drone can currently be flown under most European Regulations at present. But this 500-meter limit is not present in the new regulations. If you equip a UAS with good lightening and the UAS can be seen at 1,500 meters distance, then you are free to do so...

The other interesting fact is that the regulations do not address drones as remotely piloted aircraft but as unmanned aircraft. This distinction might sound trivial but in the new regulations an autonomous flight will be permitted as the drone is not remotely piloted (with the exception of subcategory C4 in the open category, which is further explained below). Multiple drones operated by one pilot? No mention yet so the guidance material will hopefully provide more clarification.

Last but not least, if you read between the lines, you will see that the main identified risk factor is flights over – or near – people. Buildings are not addressed, and this offers further opportunities to operate in dense urban areas (at least if you have a way of controlling the people near these buildings).

## OPEN CATEGORY

The open category is meant for low risk operations whereby no prior authorisation is required. Depending on the subcategory it can be as simple as 'Buy and Fly'.

This category caters for all recreational drone users as well as for some commercial drone activities. The Open Category is subdivided into three subcategories that stipulate the use of a specific type of drone, whether the drone is to be registered, needs electronic ID, and the pilot requirements. The table below shows a simplified version of the subcategories.





Subcategory	Description	Drone Class	MTOM	Pilot competency	Technical requirements	Electronic ID	Operator Registration
A1 Over people	Uninvolved people but not crowds	C0	< 250 g	• None	• < 19 m/s • Max height	No	No
		C1	< 900 g	• Online training • Online test	• < 19 m/s • Max height • Fail Safe	No	Yes
A2 Close to people	At a safe distance from uninvolved people	C2	< 4 kg	• Online training • Online test • Theoretical Test	• Max height • Fail Safe	Yes Ser number	Yes
A3 Far from People	Safe distance from urban areas	C3	< 25 kg	• Online training • Online test	• Max height • Fail Safe	Yes Ser number	Yes
		C4			• No automatic flight	If required	Yes

*Simplified table of subcategories in the Open Category*

So, for example, if you want to fly over uninvolved people (not part of your operation) this will mean that you can do so in the Open Category, but only with a drone that weighs less than 900 g. If you want to fly over people with a DJI Matrice 600 (MTOM > 7kg) then this operation would automatically fall into the Specific Category.

CO	C1	C2	C3	C4
Toy	DJI Spark / Mavic	DJI Phantom / Inspire	DJI M210 / M600	Model Aircraft
< 250 g	< 900 g	< 4 Kg	< 25 Kg	
Max Speed 19 m/s	n/a	Low Speed max 3 m/s	n/a	Not autonomous
n/a	Unique serial number required			n/a
Deviation possible	Fire proof marking of registration			Deviation possible
n/a	E-Identification and Geo-awareness (geofencing) required			In specific areas
n/a		Data link protection required		n/a
n/a		Lighting required		n/a
n/a	Registration required (national Responsibility)			n/a
Manufacturer to supply safety leaflet and product information				

*Simplified table of technical specifications in the Open Category*

Market Product Legislation (better known as CE markings) will be required for all drones operating in the open category and will demonstrate compliance with the technical specifications. The CE marking and the subcategory must be clearly marked on the drone. A certificate of airworthiness is not a requirement for the open category.

However, this CE marking is not mandatory until at least July 2022 and even then, there will most likely be a transition phase whereby drones produced before will not yet have to be CE certified.







The exact details of the pilot training, who should examine them or how to register a drone, are all unclear at present. The following (operational) issues are already clear at the time of writing this article:

- The previous distinction between recreational and professional use of drones is removed.
- The maximum height limit is set at 120 m.
- The safe distance from people is a minimum of 5 metres (if the drone is equipped with a low speed mode, otherwise it's 30 meters) and equal to the height at which the drone is flown (1:1 rule).
- Minimum age is 16

## SPECIFIC CATEGORY

The 'specific' category is for all operations that do not comply with the limits of the 'open' category. In this category a risk assessment must be carried out for each and every operation, and mitigation measures must be identified and adopted. The outcome of the risk assessment must be authorised by the CAA of the member state.

To assess risks a standard methodology has been devised by JARUS (Joint Authority for Rulemaking on Unmanned Systems). JARUS is a group of experts from National Civil Aviation Authorities worldwide that make recommendations on technical, operational and safety requirements for the safe integration of drones into the manned airspace. This methodology is called the **SORA**(Specific Operation Risk Assessment).

The SORA methodology divides the risk of a drone operation into two distinct classes:

1. **Air risk:** the the risk of a collision between the drone and another airspace user.
2. **Ground Risk:** the risk of collision of the drone with people, animals or objects on the ground.

For any operation that is not covered by a standard scenario, the operator must conduct the full (SORA) risk assessment and obtain permission from the CAA to go ahead with the operation.

In practise this would imply a huge workload for both the drone operators and the CAA's. In order to circumvent this workload, the concept of **standard scenarios (STS)** has been put into place. These standard scenarios describe the most common types of drone operations in conjunction with the risk assessment and the mitigation measures.

Mitigation measures are those actions that you intend to take to either prevent an incident or to limit the consequences. For example, maintaining a UAS would help to prevent a crash and the use of a self-deploying parachute would limit the consequences.

Take for example the inspection of wind turbine blades offshore. Irrespective in which country the operation is carried out, the risks and mitigation measures are going to be very





similar if not identical. With the use of a standard scenario the operator can carry out this operation without having to perform the risk assessment every time. The standard scenario describes the mitigation measures, the technical requirements etc and the operator can either declare himself that he will work compliant (**declaration**) to this scenario or that this needs to be checked by a CAA (**authorisation**). That choice will be different depending on each standard scenario. If the mitigation measures are easy to implement, then a declaration by the operator is sufficient. If these are more demanding, then an authorisation by a CAA is required.

Now where do these standard scenarios come from? In theory these should be created and/or approved by EASA. At present different and many overlapping standard scenarios are being created in each Member State and subsequently approved by the local CAA. The idea being that an individual STScan then be given to EASA and they would simply adopt these (they wish...).

But this is where it gets messy. Take for example two STS's that have been created in the Netherlands. One for flying in controlled airspace around an airport and one for flying in dense urban area. These both have a mitigation measure describing that the UAS must have a certificate of airworthiness. This may sound logical, but outside the Netherlands there are no certificates of airworthiness for an UAS. Simply dropping this requirement/mitigation measure is not an option, so alternative mitigation measures must be implemented.

After July 2020 it is no longer possible for CAA's to create STS's applicable to their own country. Those that have been approved prior will remain valid for the next two years until July 2022, unless their expiry was set earlier by the CAA. Sometime in Q4 of 2019 EASA is expected to publish two STS's.

And here EASA is seriously defaulting at present. Only two STST's by the end of 2019 is nowhere near enough to implement the regulations by the CAA's. Furthermore, there is no organised harmonisation between Member States on how to proceed with the creation of STS's to help EASA. Private initiatives between trade organisations and CAA's are initiated to achieve at least some harmonisation between member states for the creation of STS's. The 'Drone REGIM' initiative by UVS (Unmanned Vehicle Systems) International is good example of this. UVS is a non-profit organisation promoting the use of remote piloted systems.

So, if a company is in the possession of a permit to fly an STS in a country does that mean that they can do so in all other member states without having to ask permission? The short answer: no. The operator will have to contact the CAA of the country where they want to fly and check if any special local conditions apply. The CAA of the country where the operator wants to fly will then contact the CAA of the country where the operator is registered. The latter will then give the permission.





The mutual recognition by each Member State is a hot topic and a discussion point. The general EU principle is that an authorisation granted in one country in accordance with EU regulation should be recognised by all Member States. In practise however, each Member State is allowed to make changes to adapt the standard scenarios to the local conditions.

Besides conducting the SORA risk assessment, or using a standard scenario, there is a third way in how an operator can qualify for an operation in the specific category. This is through the process of obtaining the Light UAS Operator Certificate (LUC). A LUC qualified operator is allowed to assess the risks themselves and implement their own mitigation measures. Obtaining the LUC will not be an easy matter and cannot be compared to any existing permit in Europe. The operator will have to demonstrate a full functioning safety management system and a good understanding of the SORA risk assessment. The larger operators in Europe with experience in dealing with oil majors and other heavy industry with high safety standards are probably the best placed at present to quickly obtain a LUC.

## WHERE NEXT AND CONCLUSIONS

The new regulations can be compared to an architect's drawing of a new house, or better an artist impression. It shows the basic structure and all the dimensions but misses the detailed structural design as well as the nuts and bolts.

In the open category the new regulations are the clearest and can be implemented despite missing details such as the qualification and certification requirements of the pilots. In the specific category a lot – and in my opinion too much – detail is missing and there are currently no standard scenarios. Here EASA seriously defaults on their responsibility of providing the necessary details to properly implement the regulations and in the harmonisation between the different countries for the creation of standard scenarios.

It is the responsibility of each Member State's CAA to have the regulations implemented by July 2020. That may seem a long time, but most CAA's of EU Member States are currently struggling with manpower. We can be quite sure that their attention will be fully focussed on getting the new rules implemented instead of granting permits and exemptions based on the current regulations.

My advice to those entering into the industry is to apply for a permit under the existing regulations. Do this sooner rather than later. Otherwise you risk being stuck in a limbo between the old and the new. No one knows what delays are to be expected.

Most striking for present operators is the fact that most of their operations for which extensive permits are currently required will fall in the open category under the new regulations. A lot of non-drone centred organisations will enter the market both from your country as well as from the other EU member states. Take the example of onshore wind turbine blade inspections. This will in most cases be far from people and with a drone







weighing less than 25 kg. This operation can thus be conducted in the Open Category. This opens the door for companies specialised in a specific field to start using drones as just another tool. This without having to acquire all the aviation knowledge and writing an operational manual which has been a barrier to entry till present.

## BREXIT AND EU DRONE REGULATIONS

We are talking about EASA controlled airspace and not the airspace of the Member States of the European Union. However, with a Brexit, the United Kingdom will leave the single European Airspace and the EASA drone regulations will therefore not automatically apply. Future negotiations between the EU and the UK will have to resolve this matter and for the time being the current National regulations will apply. Most likely the UK will obtain a similar status as Iceland and Norway, who both have a working arrangement with EASA.

In the summer of 2019, new EU regulations for using civil drones will be published. From the moment of publication, it will take one year before these new regulations come into effect. The new regulations aim to create a level playing field in Europe and will remove (most) drone operations from the aviation domain in terms of regulation. Current manned aviation regulations are rule-based and have proven to be insufficiently flexible for the rapid changing drone market.

The new regulations are risk-based and divide the operations, whether commercial or recreational, in a low risk category (open category) and a medium risk category (specific category). The high-risk operations will remain in the (manned) aviation domain under the certified category (which is currently not addressed in the new regulations). The open category places very few demands on the pilot or operator and implies a buy-and-fly approach. Pilot qualification can be as simple as an online exam. The drones themselves will need to have a European approved product certification (CE marking).

A lot of current commercial drone operations will be possible in this open category as long as they do not take place over or near (30 m) people. This will imply a heavy influx of companies of all EU member states wanting to use drones as a tool (rather than drone centric service operators). The inspection of wind turbine blades – which usually takes place far from people – is a good example of the type of operation that will be placed in the open class.

All other operations, unless high risk, are performed in the specific category. For this category a risk assessment must be carried out by the operator with associated mitigation measures implemented, and approval requested from their National aviation authority. To ease the burden for operators and aviation authorities, a number of so-called standard scenarios will be created that should cover 90% of all operations. In a standard scenario the mitigation measures are spelled out and the operator has to declare or demonstrate that it is compliant. An example of an operation in the specific class could be aerial mapping over a populated area.





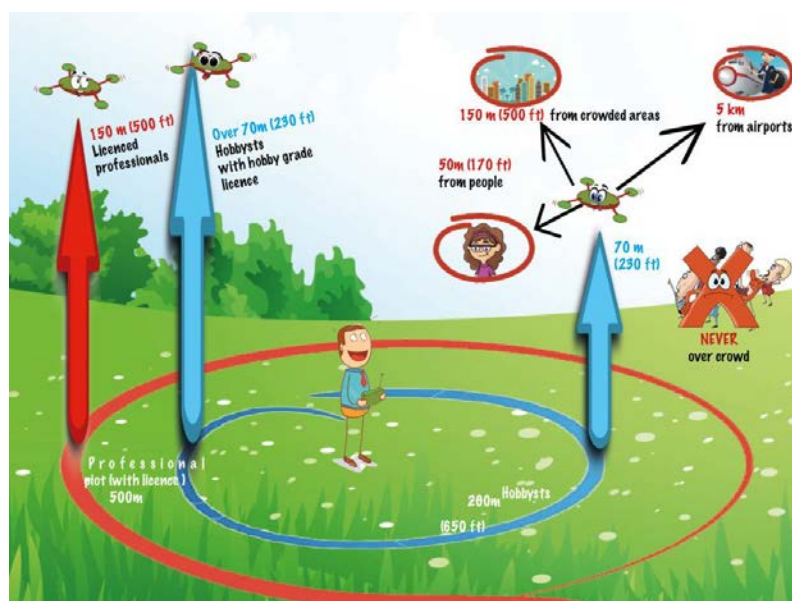
The regulations miss a lot of detail such as the required standard scenarios. These standard scenarios are being developed in most EU countries in the hope and expectation that their version will be adopted by the EU. Unless strict control is exercised and harmonisation between member states is formalised, we are set for a couple of years of regulatory ambiguities, 'grey' areas, frustration and further delays.

A strong word of advice to anyone wanting to enter the industry is to obtain permits, privileges and exemptions at a national level before the new EU regulation enters into force. After the summer of 2020 that will no longer be possible and you risk getting stuck in a "limbo" if the new regulations are delayed or not yet properly implemented.

## Italy

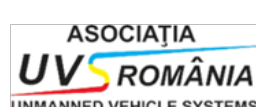
Today in Italy the use of drones is regulated by ENAC – the National Civil Aviation Authority – which has adopted its own Regulation starting from 15 December 2019, which has reached its 3rd edition. It will remain transitory until the entry into force of the definitive Regulation scheduled for 2022.

Italian Civil Aviation Authority (ENAC) it was established on 25th July 1997 by Legislative Decree no.250/97 as the National Authority committed to oversee the technical regulation, the surveillance and the control in the civil aviation field, including RPAS.



The following basic rules established by the Italian Civil Aviation Authority (ENAC) currently govern the operation of drones in Italy:

- Regulation on Remotely Piloted Aerial Vehicles (Issue No. 4 of 21 May 2018);
- Informative Notice No. 007/2017 on the implementation of standard scenarios for specialised critical operations;
- Guidelines 2016/004-NAV in respect of the design certification process;
- Guidelines 2017/001-NAV on the risk assessment for flight operations;







- Circular LIC-15 of 9 June 2016 regarding training centres and pilot licences; and
- Circular ATM-09 of 24 May 2019 on the use of airspace.

Until the entry into force of Regulation (EU) 2018/1139 on 11 September 2018 (the 'new' Basic Regulation in the field of civil aviation), the operation of drones in Italy was only governed by national rules, since drones with maximum take-off weight (MTOW) up to 150kg (ie, the vast majority) did not fall within the application of the previous EU Basic Regulation (216/2008). Otherwise, as of 11 September 2018, the new Basic Regulation applies to all drones - regardless of their MTOW - and the European Commission has recently issued delegated and implementing acts (namely Delegated Regulation (EU) 2019/945 of 12 March 2019 and Implementing Regulation (EU) 2019/947 of 24 May 2019) laying down detailed provisions regarding the production, registration and operation of drones in the European Union. These acts will be effective from 1 July 2020. Therefore, at present we are in a transition phase where each national civil aviation authority is amending its national rules to comply with the new EU regulation package. From the Italian side, ENAC has complied with the EU regulation package by way of the above-mentioned rules and relevant amendments (as appropriate).

The main aspects resulting from the analysis of the legal framework above mentioned are:

- the ENAC Regulation makes a distinction between leisure use and commercial use. Namely, drones for leisure use are called aero models and defined as 'exclusively operated for recreational and sport purposes, with no devices to allow autonomous flight and under the continuing visual line of sight of the operator'. On the other hand, commercial drones are those operated for reward or for a business purpose, such as aerial photographs, TV and movie cameras, environmental monitoring, agricultural applications, advertising, patrol and surveillance activities and training courses.

Pursuant to article 744 of the Italian Navigation Code, state drones (ie, public) are military drones and those owned by the state and engaged in public services of the police force, customs, firefighters, the Civil Protection Department or in any other national services. All other drones are considered to be private;

- under the ENAC Regulation there is a weight-based classification system for drones. Accordingly flight operations, registration procedures, licensing and authorisation requirements are increasingly regulated on the basis of the MTOW. The relevant classes of drones are the following: **Class I** (up to 0,3 kg MTOW); **Class II** (up to 2kg MTOW); **Class III** (less than 25 kg MTOW) and **Class IV** (25 kg MTOW or more);
- according to the definitions given by the ENAC Regulation, a remotely piloted drone is under the continuing operational control of a remote pilot. However, a completely autonomous drone is that on which the pilot is not empowered to intervene at any time and so it cannot control the flight after the pre-set route;
- any manufacturer wishing to engage in the serial production of drones must apply to ENAC, before commencing production and marketing of a specific drone model, to





obtain the certificate of design, which is issued by ENAC upon positive assessment of specific safety and operational requirements. To obtain a certificate of design the manufacturer must:

- hold a suitable productive organisation of means and personnel;
- provide ENAC with a complete drone configuration;
- have carried out all the necessary tests and analysis to ascertain specific conditions and limitations related to the safety of drones; and
- prepare relevant flight manual and maintenance manual for subsequent use by the operator.

The certificate of design issued by ENAC includes the following information:

- details of the manufacturer;
- drone configuration;
- scenarios of permitted flight operations, including relevant conditions or limitations; and
- related technical documents.

Any single drone produced by a manufacturer must be accompanied by a statement of conformity issued by the manufacturer itself, attesting compliance of the single product with the configuration laid down in the relevant certificate of design. Also, general product liability rules apply to the manufacture of drones, as laid down by the Italian Consumer Code (Law No. 206/2005);

- e) drones with a MTOW of 25 kg or more and flying within Italian airspace must be registered in the Drone Registry held by ENAC. In addition, irrespective of their MTOW, drones must also be registered on a specific website called [www.d-flight.it](http://www.d-flight.it), where they are assigned an identification code to be shown on both the aircraft and the ground control station.

Application for registration must be submitted by the drone's owner to ENAC, provided that the operator (if it differs from the owner) is also entitled to be mentioned in the Drone Registry.

Drones with an MTOW of 25 kg or more are identified with dedicated registration marks following the same rules established for manned aircraft. The registration marks must be applied on both the aircraft and the ground control station;

- f) no certificates or licences are required to operate drones with operating MTOW of less than 25 kg, provided that the relevant pilot must be duly certified by ENAC. On the contrary, operators willing to fly drones with MTOW of 25 kg or more must obtain a prior licence from ENAC, which is released if the operators' business organisation meets the following requirements:

- holding appropriate technical and operational instruments or assets for the intended flight operations and characteristics of the drone fleet;





- appointing a technical director for the management of operations, airworthiness and training;
- having the availability of duly certified drones;
- employing pilots duly certified by ENAC; and
- preparing the applicable flight operations manual and distributing the same to all the staff involved;

Pilot certificates are issued by ENAC approved training centres, following successful completion of a training programme and a practical exam. Programmes and exams are based on different drone categories. In addition, the applicant must obtain a certificate of medical fitness comparable to those required for pilots of light aircraft. However, pilots of drones with an operating mass of 25kg or more (or to be engaged in 'beyond line of sight' operations) must obtain a pilot's licence from ENAC as per the procedures established for flight crew members of manned aircraft. In this case training, medical and aero knowledge requirements are, therefore, stricter and more regulated than those provided for drones of less than 25 kg;

- g) drone operators must prepare a maintenance programme to ensure the continuing airworthiness of drones, following the instructions released by the relevant manufacturer. In addition, operators must set up a data recording system with respect to flight hours, safety-related events, maintenance activities and replacement of components.

Ordinary maintenance can be carried out by the same operator upon having attended a maintenance course with the relevant drone manufacturer, or with external organisations certified by the manufacturer.

Manufacturers (and related external organisations) are authorised to perform maintenance on drones belonging to their own production, including heavy and extraordinary maintenance.

- h) different regulations apply to VLOS flights and BVLOS flights. In addition, ENAC has also regulated the operation of EVLOS.

During VLOS flights the operator must always remain able to keep a visual contact with the drone without the assistance of devices, in order to monitor the flight performance at any time and avoid collision with - and damage to - other aircraft, persons, vessels, vehicles and infrastructures. Daily flights are permitted up to a maximum height of 150 metres 'above ground level' and within a maximum horizontal distance of 500 metres from the remote operator. Higher heights and distances can be authorised by ENAC on a case-by-case basis, upon submission of an appropriate risk assessment from the operator.

EVLOS operations are those conducted in areas exceeding the limits of BVLOS scenarios, in relation to which VLOS requirements are satisfied by alternative means







(such as additional ground control stations) that allow a continuous view of the drone by the operator.

BVLOS flights are performed beyond the VLOS heights and distances within segregated airspace (either temporary or permanent), always provided that ENAC identifies specific limitations and conditions from time to time on the basis of the intended flight operations and relevant risk assessment submitted by the operator to ENAC itself.

- i) under the Italian system a distinction is made between critical and non-critical operations.

Non-critical operations are conducted in VLOS and do not overfly congested areas, crowds of people, urban territories and sensitive infrastructures. Before the commencement of non-critical operations, the relevant operator must submit to ENAC a self-declaration attesting compliance with the applicable regulations and setting out limits or conditions under which the operations will be conducted. The operator is also responsible for making an appropriate risk assessment and to evaluate the continuing presence of a non-critical scenario. Before submitting the said self-declaration to ENAC, the operator is also responsible for performing test flights aimed to ensure adequate control of the drone, with a main focus on safety procedures.

Critical operations performed within 'standard scenarios' (as published by ENAC) follow the same rules above regarding non-critical operations. However, critical operations not falling within the mentioned standard scenarios (also called specialised operations) require a prior authorisation from ENAC. The relevant application must include the following:

- registration marks, type, configuration and manufacturer's statement of conformity of the drones to be used;
- results of the test flights;
- description of the planned operations;
- risk assessment documentation; and
- the flight manual, maintenance manual and operations manual of the drones to be used.

Furthermore, the operator must hold an appropriate technical and operational organisation certified by ENAC. The authorisation is granted for an indefinite period of time, to the extent that no changes are made to the systems or operations. In this respect the operator must inform ENAC of any such changes in good time, and in any case ENAC is always empowered to carry out periodic inspections and checks on the ongoing activities of the authorised operators.

During critical operations drones are allowed to overfly urban areas only in VLOS scenarios, to the extent that acceptable safety levels can be satisfied, as follows:







- the command and control primary system must be compliant with the EUROCAE ED-12 standards and design reliability level D;
- in the case of data link loss the system must be able to maintain control of the operations or at least to mitigate consequences; and
- the drone must be equipped with a flight termination system independent from the ground control station.

Otherwise, overflying crowd of people for whatever reasons (eg, sport events, entertainment shows, processions) is in all cases forbidden;

- j) The public body providing air traffic control services for drones is the Italian Air Navigation Service Provider (ENAV). In 2015, ENAV started a joint project with ENAC to establish technical and operational conditions aimed to allow a safe use of drones in different scenarios, with a main focus on BVLOS operations, overflight of urban areas, night-time flights and autonomous flights. For such purposes, ENAC and ENAV work in close cooperation with the SESAR Joint Undertaking, a public-private partnership responsible for the coordination and concentration of all EU research and development activities in air traffic management.

In 2016, ENAV was assigned a project for the set-up of an unmanned traffic management platform aimed at providing dedicated services to the drone industry. The services are accessible through the website [www.d-flight.it](http://www.d-flight.it) and include:

- registration of drones and provision of a unique code;
- graphic presentation of no-fly zones;
- electronic identification with a tag to be applied on the drone;
- tracking tools;
- mission planning for BVLOS operations; and
- locator and geo-fencing systems;

- k) there is a mandatory reporting system. In particular, operators, manufacturers and pilots of all drones (regardless of their MTOW, except model aircraft) shall report to ENAC any occurrences as per Annex V of Regulation (EU) No. 2015/1018 (laying down a list classifying occurrences in civil aviation to be mandatorily reported). Reports must be submitted to ENAC within 72 hours of the event pursuant to Regulation (EU) No. 376/2014 (on the reporting, analysis and follow-up of occurrences in civil aviation).

Also, pursuant to Regulation (EU) No. 996/2010 (on the investigation and prevention of accidents and incidents in civil aviation), in the case of accident or serious incident, the involved parties must inform ANSV within 60 minutes of the event, in the forms established by the same authority.

Investigations of air accidents involving drones in Italy are mainly governed by Regulation (EU) No. 996/2010 (on the investigation and prevention of accidents and incidents in civil aviation). The authorities in charge of such investigations are ENAC





and the ANSV. To fulfil their duties, ENAC and the ANSV may access the relevant drones, facilities, flight data records and any other useful documentation for the purposes, subject to the confidentiality and privacy obligations provided by the applicable laws;

- l) No drone flights can be conducted unless a third-party liability insurance exists for each type of operation, in compliance with the coverage laid down by Regulation (EC) No. 785/2004 on insurance requirements for air carriers and aircraft operators (as amended from time to time).

Therefore, general rules apply in terms of liability of drones for damage to third parties on the surface or in the air. Namely, article 965 of the Italian Navigation Code and the Rome Convention of 1952 apply to damage to third parties on the surface and provide for a strict liability principle against the operator. It means that evidence of the existence of a direct connection between the drone operation and the damage shall be sufficient to allocate liability, irrespective of whether the operator has acted with fault, negligence or wilful misconduct. In turn, article 966 of the Italian Navigation Code relates to damage to third parties in the air, according to which:

- if the collision is due to coincidence or force majeure, or if liability cannot be ascertained, then each operator shall bear its own damages;
  - if the collision is caused by negligence of only one of the involved operators, the same shall be responsible for all damage; or
  - if the collision is the result of joint negligence of all the operators involved, then each party shall bear its share of liability;
- m) penalties for non-compliance with the laws and regulations governing drones include conviction to economic fines and terms of imprisonment, depending on whether flight operations are conducted for recreational (ie, personal use) or business purposes, pursuant to articles 1174, 1216, 1228 and 1231 of the Italian Navigation Code.
- n) no specific import and export control rules apply to drones, provided that drones are subject to the restrictions laid down by the Regulation (EC) No. 428/2009 (setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items). In 2015, drones were included in the list of dual-use items under Annex 1 to the Regulation, for the export of which an authorisation must be required pursuant to article 3 thereof.
- o) there are no specific rules for data privacy and IP protection with reference to drone operations. Therefore, the generally applicable legislation is also valid for drones. Namely, in terms of data privacy reference must be made to the Italian Privacy Code (Legislative Decree No. 196/2003) and Regulation (EU) 2016/679 (on the protection of natural persons with regard to the processing of personal data and on the free movement of such data), while the Italian Industrial Property Code (Legislative Decree No. 30/2005), the Italian Copyright Code (Law No. 633/1941) and certain provisions of the Italian Civil Code apply to IP protection matters.



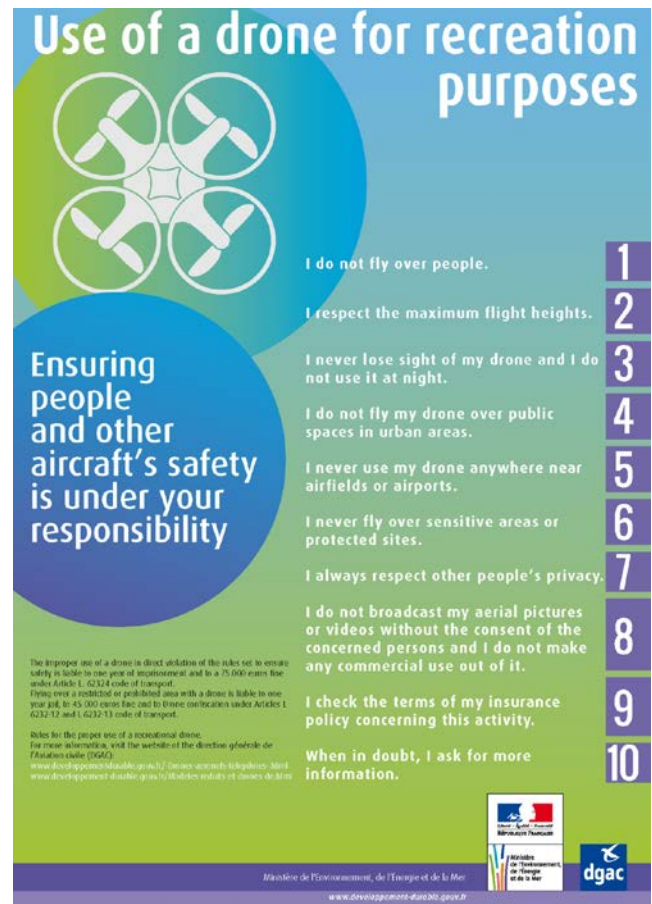


## France

The use of civilian drones in France is governed by two recent regulations that came into force on January 1, 2016. These regulations separate civilian drone use into three categories: hobby and competition flying, flying for experimental and testing purposes, and “particular activities,” which essentially means everything else, including commercial use of drones. Drones of all categories are subject to strict geographic restrictions, the main purpose of which is to protect people, property, and other aircraft. Drones may not be flown over public areas of urban zones without governmental approval, and may be flown over private property only with the owner’s authorization. Drones are required to fly under certain altitudes, and these altitude limits are substantially lower in the vicinity of airfields. Absent special authorization, drones are entirely forbidden in certain zones, such as military installations and other sensitive sites, but also historical monuments and certain national parks and natural reserves. Violation of prohibited airspace is punishable by jail time and heavy fines.

Drones flown for hobby and competition purposes are subject to certain weight and performance limits. Lighter and less powerful hobby drones may be flown by anyone, but heavier and/or more powerful ones may be flown only under authorization of the ministry in charge of civil aviation. Drones flown for experimental or testing purposes also require government authorization if they weigh more than 25 kilograms.

Drones flown for “particular activities,” which include commercial purposes, are regulated on the basis of four different types of scenarios. Different rules apply depending on which type of scenario the drone is to be used for, though many rules apply to all four scenarios. Many drones used for “particular activities” require a certification of design in order to receive authorization to fly, and all must comply with defined safety requirements. Furthermore, the operation of a drone for “particular activities” requires that the operator declare these activities to the government authorities, and certain activities require express approval. Pilots of drones for “particular activities” must have a level of knowledge and







training that depends on the type of scenario for which the drone is to be used, with some situations requiring a full pilot's license.

## I. Introduction

The use of civilian drones in France is principally governed by two recent regulations:

1. the Arrêté du 17 décembre 2015 relatif à l'utilisation de l'espace aérien par les aéronefs qui circulent sans personne à bord (Order of December 17, 2015, Regarding the Use of Airspace by Unmanned Aircraft) (Airspace Order),
2. the Arrêté du 17 décembre 2015 relatif à la conception des aéronefs civils qui circulent sans personne à bord, aux conditions de leur emploi et aux capacités requises des personnes qui les utilisent (Order of December 17, 2015, Regarding the Creation of Unmanned Civil Aircraft, the Conditions of Their Use, and the Required Aptitudes of the Persons That Use Them) (Creation and Use Order).

These two orders replace regulations from 2012 that were considered obsolete and inadequate. Both of these orders came into force on January 1, 2016.

The current regulations apply to "aircraft that move without any person on board." The order regarding the use of airspace does not apply to tethered balloons, kites, or military drones. The other order, which aims to regulate the creation of drones, their conditions of use, and the requirements for operators to receive authorization to fly them, does not apply to free-flying balloons, tethered balloons that stay below an altitude of 50 meters and have a payload of no more than 1 kilogram, rockets, kites, and aircraft used in enclosed and covered spaces.

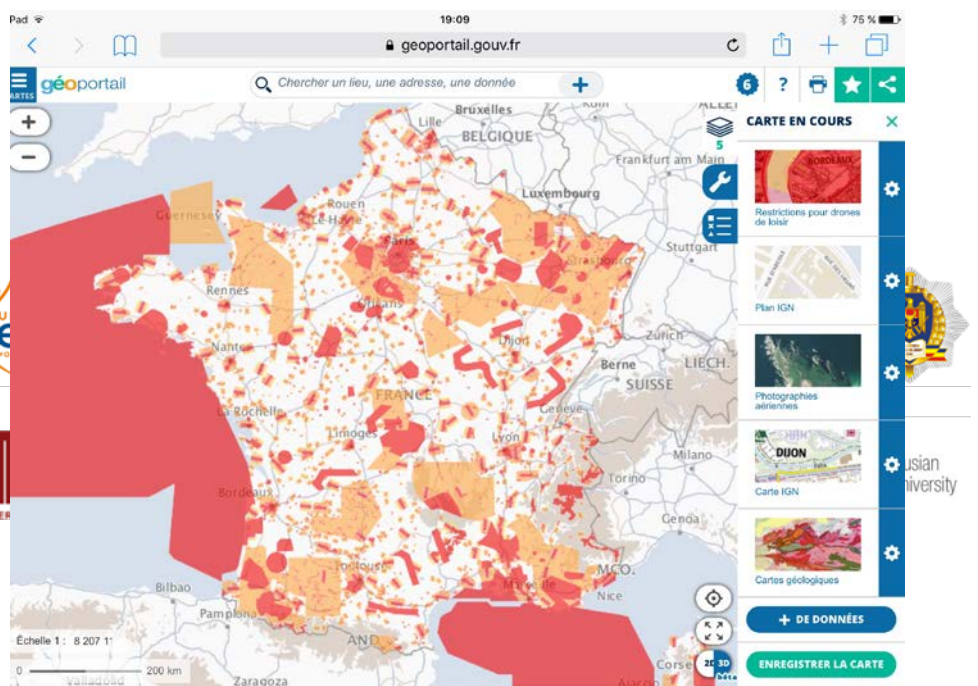
The Creation and Use Order provides for three categories of drone use:

- 1) hobby and competition flying,
- 2) flying for experimental and testing purposes,
- 3) "particular activities" (**activités particulières**), which are defined as any use that does not fall into categories (1) or (2).

The Order specifies that the meaning of "particular activities" is not limited to drone use within the context of a commercial transaction. [9] It would appear that in practice, however, this category would primarily encompass commercial use. Each of these categories is governed by a different set of rules.

## II. Airspace Limitations

Drones are subject to strict geographic restrictions, the purpose of which is to protect people and property, as







well as other aircraft. They may not be flown over public areas of urban zones, except by authorization of the local prefect. They may, however, be flown over private areas with the permission of the property owner, so long as certain speed and altitude limits are respected.

The drone must fly at a speed suitable for limiting the risks to others if there is a loss of control. Within authorized areas, drones must not fly higher than 150 meters above the ground, or higher than 50 meters above any artificial obstacle more than 100 meters in height. Within certain zones where military training exercises may occur, and during the times when those zones are active, drones are limited to an altitude of 50 meters. Drones are entirely forbidden from certain zones, such as military installations, nuclear power plants, historical monuments, hospitals, prisons, and certain national parks or natural reserves, absent prior authorization.

Drones are not allowed to fly in the immediate vicinity of an airfield, and must adhere to strict altitude limits in the surrounding zone, absent authorization from the airfield's operator. For the purposes of these regulatory provisions, the area surrounding an airfield is divided into three zones, the dimensions of which depend on the type of airfield at the center. For example, if a runway is less than 1,200 meters long and is not equipped for instrument approach procedures, the zone where drone flying is entirely prohibited (except with the airfield operator's permission) extends 5 kilometers from either end of the runway, and 0.5 kilometers from either edge of the runway. In the zone that extends from 0.5 to 3.5 kilometers from each edge of the runway, drones may not fly at an altitude of more than 50 meters without the airfield operator's permission. Finally, in the zone that extends from 3.5 to 5 kilometers from each edge of the runway, drones may not fly at an altitude of more than 100 meters without authorization. Airfields that have longer runways, are equipped for instrument approach procedures, or are used for ultralight aviation, and heliports have similar restrictions but with differences in distances and altitude limits.

Drones may not be flown at night, unless the pilot or operator obtains special authorization from the local prefect. Drones flown for hobby and competition purposes may fly at night within specific preauthorized areas. Furthermore, drones must not fly in clouds.

Manned aircraft always have the right-of-way over drones. Additionally, drones are not allowed to fly in the vicinity of fires or accident zones, so as to avoid hampering emergency and rescue services.

Flying a drone over a prohibited area, by mistake or by negligence, is punishable by up to six months in jail and a fine of €15,000 (approximately US\$17,070). Intentionally flying over a prohibited area is punishable by up to one year in jail and a fine of €45,000 (approximately US\$51,200). Furthermore, unauthorized use of photographic equipment over a prohibited zone is punishable by up to one year in jail and a fine of €75,000 (approximately US\$85,350).





### III. Hobby and Competition Drone Flying

#### A. Subcategories and Authorization to Operate

Hobby and competition drones are divided into two categories. Category A drones weigh no more than 25 kilograms, and either have no engine or are powered by an engine that is under specific power thresholds (for example, a combustion engine of no more than 250 cm<sup>3</sup>, or an electric engine of no more than 15 kW). In an exception to these limitations, tethered drones fall into category A regardless of any propulsion they may have, so long as they weigh no more than 150 kilograms. Any drone that does not fall into category A is considered to be a category B drone.

Category A drones may be flown by anyone, and do not require any authorization documents as long as the regulatory parameters are respected (flying only in permissible areas, no flying by night, etc.). Category B drones, however, cannot be flown without authorization from the ministry in charge of civil aviation, and only the individuals who are specifically listed on the authorization document may fly the drone. Before granting authorization, the ministry is to verify the drone's airworthiness as well as the pilot's aptitude to fly it. The authorization is valid indefinitely, so long as the conditions under which it was given are still true. Authorized pilots must annually send a statement confirming that the drone is still in compliance with the conditions under which the authorization was granted.

#### B. Flying Conditions

The general rule is that drones should stay within their pilot's line of sight. However, a drone may be flown outside of the pilot's line of sight if a second person keeps it in view while it is outside of the pilot's view. The pilot, or other persons watching the drone while it is out of the pilot's view, must always be able to ensure that the drone is flying in safe conditions and be able to take control of the drone if need be. If the drone weighs no more than 2 kilograms, travels no more than 200 meters from its pilot, and flies no higher than 50 meters, it is possible to fly outside of the pilot's line of sight as long as another person keeps it in view and is able to inform the pilot of dangers in real time. Finally, French regulations allow the flight of drones that are able to fly autonomously by following atmospheric movements, as long as they weigh less than 1 kilogram and fly for less than eight minutes.

### IV. Flying Drones for Experimental and Testing Purposes

Annex II of the Creation and Use Order applies specifically to drones that are flown for experimental or testing purposes—that is to say, prototypes—or drones flown in order to develop a new technology or modified to go beyond the parameters they were initially designed for. Flying such drones requires a special permit, to be provided by the ministry in charge of civil aviation. The application for this permit must include a description of the proposed conditions of the experimental flights, and





of the measures taken to ensure the safety of third parties both on the ground and in the air. Drones that weigh no more than 25 kilograms do not require a special permit as long as they fly during daytime, within the pilot's line of sight, no farther than 200 meters from the pilot, outside of any populated area, and at least 50 meters away from any person who is not involved in the drone's operation. The other restrictions on flight described in Part II above also apply to experimental drones.

## V. Other Drone Activities (“Particular Activities”)

Annex III of the Creation and Use Order applies to drones that are flown neither for leisure and competition, nor for experimentation and testing purposes. French regulators essentially made “particular activities” a sort of catchall category by not explicitly defining such activities. It appears, however, that this category primarily aims to apply to the commercial use of drones.

The following rules apply to drones that have a mass of less than 150 kilograms. For drones of 150 kilograms or more, the ministry in charge of civil aviation is to define the authorized flight and use conditions on a case-by-case basis; such drones are subject to regulation at the European Union level.

### A. Four Basic Scenarios

The regulations laid out in Annex III of the Creation and Use Order are based, to a great extent, on four categories of situations (referred to as “scenarios” in the regulation), designated as S-1, S-2, S-3, and S-4. These categories are defined as follows:

- **S-1:** Using a drone outside a populated area, without flying over any third party, staying within the pilot's line of sight, and within a horizontal distance of no more than 200 meters from the pilot;
- **S-2:** Using a drone outside a populated area, where no third party is within the area of operation, within a horizontal distance of no more than 1 kilometer from the pilot, and not falling within the definition of S-1;
- **S-3:** Using a drone in a populated area, but without flying over any third party, staying within the pilot's line of sight, and within a horizontal distance of no more than 100 meters from the pilot;
- **S-4:** Using a drone outside a populated area, but not in a manner falling within the definitions of S-1 or S-2.

Some of these scenarios place restrictions on the type of drone that can be used in them. In an S-2 scenario, only drones weighing 2 kilograms or less may be flown at an altitude of more than 50 meters. Only tethered drones or untethered drones weighing no more than 8 kilograms may be used in an S-3 scenario. Furthermore, only drones weighing 2 kilograms or less may be used for an S-4 scenario, and this use must be limited to measurement taking, aerial photography, observation, or surveillance. Finally, tethered aerostats that fly







autonomously must abide by the same rules as nonautonomous tethered aerostats in scenarios S-1 or S-3. With the exception of tethered aerostats, drones that fly autonomously may not be used for “particular activities.”

## B. Certification of Design and Required Safety Features

The following drones require a certification of design (***attestation de conception***) in order to be flown: drones of more than 25 kilograms, drones used in an S-2 scenario, drones of more than 2 kilograms used in an S-3 scenario (except for tethered aerostats), and drones used for an S-4 scenario. A certification of design is granted by the ministry in charge of civil aviation on the basis of an application that shows that adequate analysis and tests have been conducted to ensure that the drone is safe to use as proposed. Drones that do not require a certification of design must nonetheless comply with the same safety requirements, and their operators must be able to demonstrate compliance if so asked by the government authorities in charge of civil aviation.

The application for a certification of design must include a checklist of safety checks to be done before each flight, the drone’s weight limitations, restrictions with regard to weather conditions, programmed safety mechanisms, and emergency procedures. The application must also include a maintenance manual, the radio frequencies used by the drone, and descriptions of the measures available to protect third parties. The measures to protect third parties must be able to limit the impact energy to 69 joules if the drone drops from its maximum operational altitude, and the pilot must be able to trigger them even if the automated systems on board the drone malfunction.

There are also a number of safety requirements that apply specifically to certain types of drones. For example, aerostats may use only inert gases, and the tethers of tethered drones must comply with defined resistance requirements. For all untethered drones, the pilot must be informed of the aircraft’s altitude on the basis of a barometric instrument, and there must be a programmable system to automatically prevent the drone from going beyond a maximum altitude even if the pilot instructs it to do so. The pilot of an untethered drone must also be able to make it land at any moment by cutting its propulsion, and there must be a system for the drone to automatically initiate a landing procedure if it loses contact with the remote control. The initiation of such an automatic landing may be preceded by a wait procedure to give the pilot an opportunity to reestablish contact, but this wait time must be short enough to minimize the chances that another malfunction could occur.

Furthermore, there are a number of safety requirements that apply specifically to certain types of drone uses. For example, a drone to be used in an S-2 scenario must comply with the following requirements in order to obtain a certification of design:







- The pilot must have access to information on the position and movement of the aircraft in real time, so as to ensure that it does not go beyond the intended limits of its flight;
- The drone must have an automatic system to prevent it from going beyond the horizontal distance limits of the flight, or must have an alarm system to warn the pilot when it goes beyond those limits.
- The function to stop propulsion in flight, as required of all drones used for “particular activities,” must be independent from the on-board automatic mechanisms that control the aircraft’s flight path.
- There must be an on-board system to record the essential parameters of the flight, such as location, altitude, and quality of the control signal, in order to allow an analysis of the last twenty minutes of flight.

Similarly, heavier-than-air drones of more than 2 kilograms that are to be used in an S-3 scenario must be equipped with a system to protect third parties, which is supposed to automatically activate if the drone lands by itself following a loss of contact with the pilot. Heavier-than-air drones of more than 4 kilograms must, in addition, have equipment to ensure that the pilot can know the aircraft’s speed. The system to protect third parties from the fall of heavier-than-air drones of more than 4 kilograms must also automatically stop the propulsion system, the control link for that emergency system must be independent from the drone’s main control link, and there must be an audible alarm to warn of the drone’s fall.

Failure to comply with these requirements is punishable by up to one year in jail and a fine of €75,000.

## C. Conditions of Operation

Operation of a drone for “particular activities” requires that the operator make a declaration to the authorities in charge of civil aviation describing the activity for which he/she is using the drone. This declaration must be renewed every two years if the activity stays the same, but any changes must be declared immediately. Additionally, operations falling within an S-4 scenario require the government’s approval.

In January of each year, every drone operator who falls within the “particular activities” regulations must send a report to the ministry in charge of civil aviation. This report provides the number of hours of flight flown during the previous year, gives a summary of any problems encountered, and states the airworthiness of any drone weighing more than 25 kilograms.

Any drone used for “particular activities” must have an identification plate affixed to it, showing the operator’s name and contact information. Presumably, this is





to ensure that the operator could be easily identified for purposes of establishing liability in case of an accident.

A drone's operator is responsible for knowing, and for periodically evaluating, the level of competence of the pilots who fly it.

## D. Qualifications Requirements for Professional Drone Pilots

Pilots of drones for “particular activities” must have, or have had, a certificate of theoretical competence for flying a manned aircraft. An exception is made for pilots of tethered aerostats, who are required only to be able to read aeronautical information. Beyond this theoretical competence, drone pilots must take a practical training course determined by the drone operator as necessary to perform the flights required by the “particular activity” in question.

Pilots of drones in S-4 scenarios are subject to additional requirements, which include having a manned aircraft pilot's license (for either an airplane, a helicopter, or a glider) and at least one hundred hours of flight operating this aircraft as a pilot. Furthermore, the pilot must have had at least twenty hours of practical experience flying the drone in the six months prior to the S-4 flight.

The pilots of drones other than tethered aerostats weighing more than 25 kilograms must perform a demonstration flight before an agent of the ministry in charge of civil aviation before they are authorized to perform a “particular activity.”

### Poland

In Poland the operation of unmanned aircraft systems for commercial purposes requires the pilot to obtain a certificate of competence. Systems weighing more than 25 kg must be certified and registered. Operation in the proximity of airports and other

### SPORT AND RECREATIONAL FLYING WITH UNMANNED AERIAL VEHICLES





special zones is restricted. Flights below the visual line of sight of the operator are possible only in dedicated areas.

## I. Legal Framework

The use of unmanned aircraft systems (UAS) in Polish airspace is regulated by the Aviation Law Act and the following implementing regulations issued by the Minister of Transport, Construction and Maritime Economy:

- Regulation of March 26, 2013, on the Exclusion of Some Provisions of the Aviation Law Act for Certain Types of Aircraft and Determining the Conditions and Requirements Relating to the Use of Such Aircraft, which sets out the rules for operation of UAS weighing less than 25 kg;
- Regulation of June 3, 2013, on Certificates of Competency applicable to the operators of UAS;
- Regulation of April 26, 2013, on the Technical and Operational Rules on Aircraft of Special Category, Not Subject to the Supervision of the European Aviation Safety Agency, which mostly applies to UAS weighing more than 25 kg.

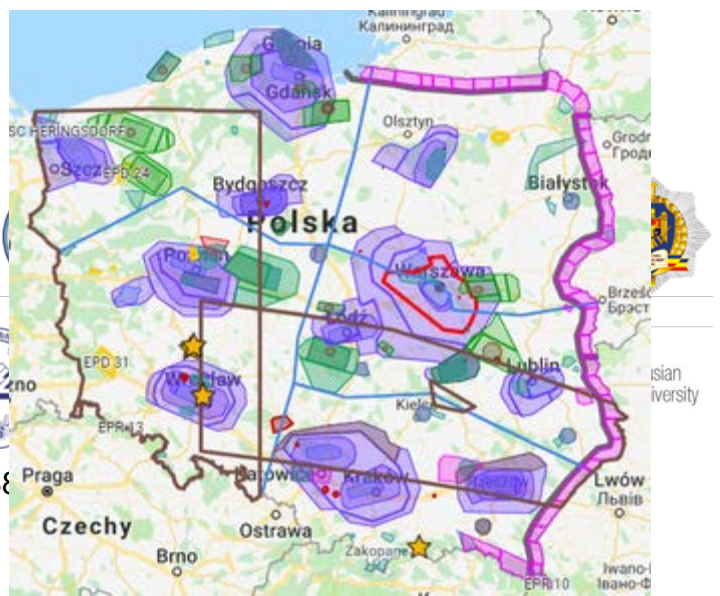
Polish regulations do not address the issue of personal data protection and privacy concerning the use of UAS; however, flights above another person's property may constitute an infringement of personal rights.

## II. Certification of Operators

Polish law differentiates between commercial and noncommercial use of UAS flights. Operators of commercial UAS flights, including providers of photography and video-making services, must have a certificate of competency from the Civil Aviation Authority (CAA), which is issued to individuals who have passed a medical check-up, taken theoretical and practical tests, and have insurance.

The certificate of competency can allow for operation in VLOS (visual line of sight) or BVLOS (below visual line of sight) conditions. Obtaining a VLOS operation certificate requires the applicant to sign a declaration of knowledge of relevant regulations and basic theory (airspace, emergencies, flight rules, etc.), and pass theoretical and practical tests conducted by a CAA examiner. A certificate of competency for BVLOS operation allows a pilot to fly beyond the line of sight and requires the applicant to take training courses in addition to successfully passing theoretical and practical tests.

The certificate of competency can be limited to certain weight ranges (from less than 2 kg to less than 150 kg) and classes of UAS (airplane, helicopter, airship, or multirotor). As of October 2015 more than 1,500 certificates of competency had been issued.







### III. Registration of UAS

Registration is not required for UAS weighing less than 25 kg. If the weight exceeds 25 kg a permit to fly is required and operational restrictions may be applicable (e.g., VLOS only and/or minimum distance from populated areas, people, and property).

Moreover, telecommunications law requires a license if the UAS uses certain frequencies for communication, although most UAS use frequencies that do not require a license.

### IV. Operational Restrictions

Operation in VLOS mode must allow the remote pilot to maintain separation and avoid collision with any other aircraft. Flights must be conducted outside the controlled zones (which sometimes cover most of a town or a city, airfield traffic zones, military airport zones, and other specific zones. Advance notice and a special permit are required to operate a UAS in an airport controlled zone. For flights in airport traffic zones or within 5 km of an airport/airfield border, the permission of the airport manager is required.

Currently, BVLOS flights are possible only in dedicated and segregated airspace. The rules for BVLOS operations, including the procedures for cooperation with air traffic service providers, are being developed by the Polish CAA.

Regulations require that the horizontal distance from people and structures on the surface must be sufficient to exclude any risk to people, property, or the environment, even after any possible failure. Moreover, operations in the city center of Warsaw require the consent of the Government Protection Bureau. Following an incident in Warsaw's airport the authorities announced they were considering installing equipment that would disable UAS in the proximity of the airport.

Penalties for failing to comply with these restrictions are set out in the Aviation Law Act and provide for up to five years of imprisonment.

In January 2019, CAA Poland updated the provisions of the above mentioned legislative framework, the main changes being mentioned below:

### Recreational or Sports Flights

If you fly a drone or a flying model for fun or as part of a sports competition, you can fly:

- without a UAVO certificate of qualification;
- within visual line of sight;
- in FPV if the drone does not exceed 2kg;
- without aero-medical examinations.

Remember, however, that when you are flying, you are responsible for exercising extreme caution due to air traffic safety and peace and public order. Remember to fly only the equipment that is technically efficient. It is you as the operator who is responsible for the safe and lawful use of a drone or a flying model.







This article discusses the rules of flight in a general way. Details can be found in the regulations to which the link can be found at the end of the article. Each operator has a legal obligation to familiarize with the applicable regulations and apply them in practice.

## General rules of flight

If the weight of your drone does not exceed **600 g**, maintain a safe distance from towns, cities, settlements or gatherings of people in the open air as well as from people, vehicles, buildings that are not under your control (this distance is not determined by the rules in meters. As an operator you decide what distance you need so that the equipment you fly does not hurt anyone).

If the weight of your drone or model exceeds **600 g**, you should stick to the following rules:

- maintain a horizontal distance of not less than 100 m from the buildings of towns, cities, settlements or gatherings of people in the open air (you can fly in the city, if you find enough space);
- maintain a horizontal distance of not less than 30 m from people, vehicles or constructions that are not under your control (you should not fly directly over people).

**Regardless of the weight of the drone or model you fly**, you should also follow the following rules:

- you or a person assisting you with flying should constantly keep eye contact with the drone or model, so that it can easily be determined in the air and, if necessary, avoid collision with other airspace users or obstacles. You may temporarily lose eye contact with the drone or model when checking flight parameters transmitted by equipment being a drone or flying model equipment;
- if you fly with camera view (FPV) and there is nobody with you who can observe the drone or model you fly, remember:
  - not to fly higher than 50 m above ground level,
  - at a horizontal distance of more than 200 m from each other,
  - at a distance of less than 100 m from the building or from gatherings of people in the open air (you can fly in the city if you find enough space).

Remember that there are also places in the Polish airspace where you cannot fly for safety reasons or you must obtain a special clearance for a flight in a given zone. If you want to easily check where you can fly, and where not, visit the website of the Polish Air Navigation Services Agency (PANS) where you will find the appropriate application.

Below you will also find a general description of the zones to pay special attention to.

- **Airports, firing ranges and military units** – you cannot fly over these objects;
- **Prohibited Area (P)** – you can fly only with the clearance provided by the prohibited area operator and under conditions defined by the operator;
- **Control Zone (CTR) and Aerodrome Traffic Zone (ATZ)** – you can fly only under conditions specified by the air traffic service provider or with the clearance of CTR or





ATZ operator and under conditions defined by the operator. You do not need clearance:

- a) for flights within visual line of sight (VLOS) with drones or flying models weighing not more than 25 kg at a distance of more than 6 km from the airport boundary and up to 100 m above ground level;
  - b) for flights within visual line of sight (VLOS) with drones or flying models weighing less than 600 g at a distance of less than 1 km from the airport boundary and not higher than 30 m or up to the highest obstacle, including trees or buildings within a radius up to 100 m from you;
- **Danger Area (D)** – you can only fly with the clearance of the danger area operator and under conditions defined by the operator;
  - **Military Control Area (MCTR)** – you can only fly with the clearance of the MCTR operator and under conditions defined by the operator;
  - **Military Aerodrome Traffic Zone (MATZ)** – you can only fly with the clearance of the MATZ operator and under conditions defined by the operator;
  - **Restricted Area (R)** – in case of drones and flying models, this is the area covering the airspace located directly over the national park where you can fly with the clearance of the operator of the given national park and under conditions defined by the operator;
  - **Air Defense Identification Zone (ADIZ)** – this zone is located along the entire eastern border of Poland. In this zone you can fly after notifying your location and time of flight to air traffic service (ATS) unit responsible for the airspace in which the flight is to be performed, or to AMC Polska (Airspace Management Cell of the Polish Air Navigation Services Agency).

## Flights other than recreational or sports flights with visual line of sight (VLOS)

Flights other than recreational or sports flight performed in VLOS and FPV operations. If you are flying a drone for purposes other than recreation or sport (e.g. you run a business using the unmanned aerial vehicle (UAV) or you use it as part of your job), you have rules that you must follow as a UAV operator. This article discusses the rules of flight in a general way. Details can be found in the regulations to which the link can be found at the end of the article. Each operator has a legal obligation to familiarize with the applicable regulations and apply them in practice.

## General conditions and rules of flights

### Ratings

First, you should have a “certificate of qualification of unmanned aerial vehicle operator (UAVO)” used for purposes other than recreation or sport with a rating to perform VLOS operations (it also entitles to limited FPV flights). This is a document issued by the President of the Civil Aviation Authority (CAA). You will receive it after completing a special training course and passing the necessary exams. If you are under 18 you will need the consent of your legal guardians to obtain a certificate of





qualification. You will also fly under the supervision of an adult. One of the conditions is also having appropriate third party liability insurance.

- **Aero-medical examination**

If the UAV you are using is heavier than 5 kg, you also need to obtain the appropriate aero-medical examinations.

- **Responsibility**

First of all, remember that when you are flying, you are responsible for exercising extreme caution due to air traffic safety and peace and public order. Remember to fly only with the equipment that is technically efficient. It is you as the operator who is responsible for the safe and lawful use of an unmanned aircraft.

- **Rules of flight**

VLOS and FPV flights should adhere to the following rules.

a) in VLOS operations:

- maintain a safe distance from aircraft, buildings, gatherings of persons in the open air as well as from persons, vehicles and constructions which are not under your control in each phase of flight. The safe distance is not determined by the rules in meters. As an operator you decide what distance you need so that the equipment you fly does not hurt anyone;
- you or at least one observer should keep eye contact (with the unaided eye) with UAV in order to determine its location in the airspace and ensure a safe distance from other aircraft, obstacles, people or animals. In VLOS operations you may temporarily lose eye contact with UAV when checking flight parameters transmitted by equipment being a UAV ground equipment;

b) in FPV operations:

- UAV with a maximum take-off weight of 2 kg;
- up to a height of not more than 50 m above the ground level;
- at a horizontal distance of not more than 200 m from the operator;
- at a horizontal distance of not less than 100 m from the buildings of towns, cities, settlements or gatherings of people in the open air;

c) in VLOS and FPV operations:

- providing full flight control, in particular by remote control using radio waves;
- taking into account the meteorological conditions, structure and classification of airspace as well as information on air traffic limitations:
  - **in CTR:** under conditions specified by the air traffic service provider;
  - **in ATZ:** with the clearance of the ATZ operator and under conditions specified by the operator;
  - **in Danger Area, MCTR or MATZ:** only as cleared and needed by the area/zone operator and under conditions specified by the operator;







- **in Restricted Area** covering the airspace located directly over the area of the national park you can fly with the clearance of the operator of the given national park and under conditions defined by the operator;
- **in EP R40 Słupsk**: only the aircraft referred to in Article VII para. 3 of the Implementing Agreement between the Government of the Republic of Poland and the Government of the United States of America to the Agreement between the Government of the Republic of Poland and the Government of the United States of America concerning the deployment of ballistic missile defense system in the territory of the Republic of Poland regarding use of land areas and airspace surrounding the ballistic missile defense system base, signed in Warsaw on 27 April 2015 (Journal of Laws of 2016, item 234), upon approval referred to in this provision;
- **in Prohibited Area**: only as cleared and needed by the area operator and under conditions specified by the operator;
- **in ADIZ**: after notifying your location and time of flight to air traffic service (ATS) unit responsible for the airspace in which the flight is to be performed, or to AMC Polska (Airspace Management Cell of the Polish Air Navigation Services Agency);
- in case of flights within building structures: as cleared by the facility operator and in accordance with agreed safety rules;
- flights performed over:
  - closed areas,
  - nuclear facilities,
  - areas, facilities and devices referred to in Article 5 para. 2 point 1 letter a and b, point 2 letter a and b and point 3 letter a and b of the Act of 22 August 1997 on the protection of people and property (Journal of Laws of 2018, item 2142),
  - military units and firing ranges, can be performed only as cleared and needed by the area/facility/device operator.
- flights over fuel pipelines, power lines and telecommunications lines, water dams and locks and other devices located in open area, the destruction or damage of which may endanger human life or health, the environment or cause serious material damage, is carried out with extreme caution;
- operations in CTR, ATZ, ADIZ and Prohibited areas may be performed **by UAVs with a mass not exceeding 600 g** in VLOS conditions without issuing clearances by the operator under conditions specified above, when flying at a distance of more than 1 km from the airport boundary or 500 m from the site protected by the Prohibited area and up to 30 m or up to the highest obstacle, including trees or building structures, within a radius of up to 100 m from the operator;





- operations in CTR and ATZ may be performed by UAVs with a mass not exceeding 25 kg in VLOS conditions without issuing clearances by the operator under conditions specified above when flying at a distance of more than 6 km from the airport boundary and up to 100 m above the level area.

## UAV operation rules

In addition to the requirements concerning flight rules and operators' ratings, regulations also specify obligations of entities operating UAVs:

- a) the entity operating a UAV is obliged to:
  - label all equipment with a nameplate containing the name of the entity owning the unmanned aircraft;
  - include preventive recommendations of the Civil Aviation Authority (CAA), if issued, in the operations manual;
- b) UAVs used for flights earlier than 30 minutes before sunrise and later than 30 minutes after sunset must be fitted with a warning light mounted in a manner that provides an omnidirectional light distribution, visible from above and below;
- c) UAV must be fitted with a "failsafe" system programmed in a manner consistent with the CAA preventive recommendations, if issued;
- d) the operator performing the flight is required to wear a warning vest;
- e) an entity providing aerial services using unmanned aircraft must develop an Operational Manual which:
  - defines a safe way to provide aerial services and includes in particular:
    - data of the entity providing services,
    - list of operated UAVs,
    - personnel data indicating their ratings,
    - process of risk analysis of air operations in relation to operated UAVs,
    - list of control activities carried out before take-off and after landing,
    - procedures and principles of performing air operations,
    - emergency procedures;
  - is subject of review if requested by the President of the Civil Aviation Authority;
  - is supplemented and amended in the manner necessary to keep it up to date;
  - takes into account preventive recommendations of the President of the Civil Aviation Office issued on the basis of Article 21 para 2 point 15 letter c of the Aviation Law Act.

## Flights other than recreational or sports flights beyond visual line of sight (BVLOS)

Operational, specialized, automatic and training flights performed in BVLOS operations  
If you are flying an unmanned aerial vehicle (UAV) for purposes other than recreation or





sport (e.g. you run a business using UAV or you use it as part of your job) and you plan to use it in BVLOS operations, you have rules that you must follow as a UAV operator. This article discusses the rules of performing BVLOS flights in a general way. Details can be found in the regulations to which the link can be found at the end of the article. Each operator has a legal obligation to familiarize with the applicable regulations and apply them in practice.

## General conditions and rules of flight

- **Ratings**

As an operator, you should have a “certificate of qualification of unmanned aerial vehicle operator (UAVO)” used for purposes other than recreation or sport with a rating to perform BVLOS operations. This is a document issued by the President of the Civil Aviation Authority. You will receive it after completing a special training course and passing the necessary exams (for more information, refer to the “Certificates of qualification/exams” tab). One of the conditions is also having appropriate third party liability insurance.

- **Aero-medical examination**

To obtain a certificate of qualification with BVLOS rating, appropriate aero-medical examinations are required (for more information, refer to the “Aero-medical certificate” tab).

- **Responsibility**

First of all, remember that when you are flying, you are responsible for exercising extreme caution due to air traffic safety and peace and public order. Remember to fly only with the equipment that is technically efficient. It is you as the operator who is responsible for the safe and lawful use of UAV and its separation from other aircraft. Carefully plan your missions and get acquainted with the traffic situation in the airspace in a given area.

- **UAV registration**

Every unmanned aircraft used in BVLOS operations must be entered into aircraft records kept by the President of the Civil Aviation Authority or into a foreign register or records of civil aircraft (register or records of another country).

- **Types of flights that can be carried out**

BVLOS flights, which can be performed as part of the clearance obtained in compliance with applicable regulations are divided into several categories, which differ in terms of the scope of requirements that must be fulfilled to be carried out. These are operational, specialized, automatic and training flights:

a. **operational flights** are carried out as part of or for the purposes of activities:

- of state aviation (armed forces, police, border guard, state fire-fighting service);
- of customs-tax service;
- related to preventing or combating natural disasters or catastrophes;







- related to health care system;
  - related to search or rescue;
  - related to the protection of the internal security of the state;
  - related to the recognition of safety hazards and environmental protection;
- b. **specialized flights** are carried out as part of or for the purposes of:
- supervision, monitoring, control or protection of land or water civil engineering works, forest or water areas, people or property;
  - geodetic activities related to agriculture or forestry;
  - research, test, trial or demonstration flights;
- c. **automatic flights** are carried out as part of or for the purposes of:
- supervision, monitoring, control or protection of land or water civil engineering works, forest or water areas;
  - agro-aerial activities;
  - medical supplies;
  - research, test, trial or demonstration flights;
- d. **training flights** are carried out as part of the training activities referred to in Article 95 a of the Aviation Law Act.

## Clearance to perform operations

It should be remembered that operational, specialized, automatic and training flights can be performed only by authorized entities which received clearance of the President of the Civil Aviation Authority. Clearance may be granted only after meeting the requirements by the requesting entity and by the unmanned aircraft that will be used as part of the clearance.

## Obtaining clearance for operational, specialized, automatic and training flights - requirements related to unmanned aerial vehicles

The issuance of clearance referred to above is dependent on the appropriate UAV equipment, which is as follows:

1. in case of an UAV being aeroplane, it shall be equipped with:
  - green continuous light, placed on the right wing, visible above and below the horizontal plane of the wing;
  - red continuous light, located on the left wing, visible above and below the horizontal plane of the wing;
  - white flashing light placed on the top of a vertical stabilizer or, in the absence thereof, on the upper surface of the hull in a manner ensuring an omnidirectional light distribution;
2. in case of an unmanned aerial vehicle being a multirotor, helicopter or aerostat, it shall be equipped with white flashing light, placed on the upper surface of the hull in a manner ensuring an omnidirectional light distribution;
3. each UAV used in BVLOS operations should be equipped with devices or systems mounted on board or being its ground equipment, to enable:





- preservation of assumed flight parameters;
  - ongoing monitoring of flight parameters, including definition of flight path, flight speed, flight altitude using a barometric altimeter, the degree of battery charging or the degree of fuel consumption, quality and power of the communication signal between unmanned aerial vehicle and remote control station;
  - basic location – determination of current location, speed, altitude and direction of UAV flight in order to transfer these data to air traffic service provider via CIS system or by telephone as requested by ATS unit;
  - emergency location – the operator's determination of UAV current position in the event of irretrievable loss of UAV control capabilities or the occurrence of communication breaks between the UAV control station and the UAV;
  - automatic execution of an emergency procedure, including flight termination by emergency landing, or continuing a flight on a pre-programmed route, or an arrival to a pre-programmed location;
  - recording of flight parameters from the moment when the UAV control system is started until the system is turned off;
4. UAV should also be equipped with a camera allowing observation of its surroundings in order to reduce the risk of collision with another aircraft or obstacle.

## Requirements related to the entity performing flights

Each entity performing operational, specialized, training and automatic flights is obliged to have and use an operational manual which is constantly updated, takes into account preventive recommendations of the President of the Civil Aviation Authority and is made in Polish or English. The manual must contain the following elements:

- a) name and address of the registered office of the entity providing aerial services, its telephone number, e-mail address, tax identification number (NIP) or number in another register in which the entity was registered;
- b) a list of unmanned aerial vehicles used, including their identification marks;
- c) first and last name, number of the certificate of qualification and validity date of liability insurance of the operator performing or supervising the flight;
- d) assessment and information on the method of limiting the risk of flight operations;
- e) general list of control activities carried out before takeoff and after landing;
- f) procedures and rules for performing air operations;
- g) general emergency procedures;
- h) procedure for providing inspections of UAV technical condition.





In addition, every operator performing flights is required to wear a warning vest while performing air operations. If the operator is not in an open area, it should be clearly indicated where he is located.

## Obtaining clearance

Clearance for operational, specialized, training and automatic flights is obtained at the request of the entity that intends to perform such flights.

Clearance is issued after the President of the Civil Aviation Authority verified that the entity meets the requirements concerning operations manual, personnel qualifications, insurance and UAV equipment required by the regulations. Clearance is issued for a period of 12 months.

The President of the Civil Aviation Authority notifies PANSA about entities that have obtained clearance to perform operational, specialized, automatic and training flights. Information is provided within two working days from the date the clearance is issued by the President of the Civil Aviation Authority.

## Flight conditions

The basic condition that must be met to perform the operations described above is the notification of the willingness to perform a flight to PANSA and publication by the Agency, information on UAV planned and implemented flights. Without fulfilment of these conditions, the flight cannot take place.

The entity wishing to perform a flight informs PANSA about its intention to perform the flight at least 7 days before the date of the flight. Then PANSA publishes information about:

- a) UAV planned flights:
  - at least 2 days before the flight date – in case of operational, specialized, automatic and training flights;
  - on the day of flights – in case of operational flights, if it was not possible to plan the flight earlier;
- b) UAV performed flights providing:
  - the route of the flight or the area in which the flight will take place;
  - flight altitude above mean sea level (AMSL) along the entire route or on individual sections of the route;
  - flight time planned by the operator;
  - UAV identification mark.

Both the entity submitting to PANSA the desire to perform the flight and the Agency itself, will use communication and information system or electronic communication means (e-mail, website or special application), as indicated by PANSA, to communicate between themselves and to publish flight information. PANSA will issue flight conditions and publish information on their implementation only in the case of entities that have previously received clearance of the President of the Civil Aviation Authority to perform BVLOS operations.







## Flight performance

Once the flight information has been published, the operations must be carried out under the following conditions and rules:

- i. taking into account the comments provided by PANSA regarding the route and the area in which the flight will take place;
- ii. operational, specialized or training flights:
  - up to not more than 120 m above ground level;
  - at a speed of not more than 150 km/h;
- iii. automatic flights:
  - up to 50 m above ground level or up to 50 m above the highest obstacle within a radius of 100 m from the place of flight,
  - at a horizontal distance of less than 100 m from buildings of towns, cities or settlements under permission and conditions specified by town/city authorities,
  - at a speed of not more than 150 km/h;
- iv. training flights at a horizontal distance of at least 150 m from housing estates and other population centers and at a horizontal distance of not more than 500 m from the operator performing the flight;
- v. ensuring full flight control;
- vi. at a safe distance from other aircraft, obstacles, persons or animals, taking into account the meteorological conditions and information on air traffic restrictions;
- vii. in CTR: under conditions specified by PANSA;
- viii. in ATZ: under clearance and conditions specified by ATZ operator;
- ix. in Danger Area, MCTR or MATZ: only as cleared and needed by area/zone operator and under conditions specified by the operator;
- x. in Prohibited Area: under clearance and conditions specified by the area operator;
- xi. in Restricted Area covering the airspace located directly over the area of the national park, under clearance and conditions specified the operator of a given national park;
- xii. in EP R40 Słupsk: only the aircraft referred to in Article VII para 3 of the Implementing Agreement between the Government of the Republic of Poland and the Government of the United States of America to the Agreement between the Government of the Republic of Poland and the Government of the United States of America concerning the deployment of ballistic missile defense system in the territory of the Republic of Poland regarding use of land areas and airspace surrounding the ballistic missile defense system base, signed in Warsaw on 27 April 2015 (Journal of Laws of 2016, item 234), upon approval referred to in this provision;





- xiii. in ADIZ: after notifying your location and time of flight to air traffic service (ATS) unit responsible for the airspace in which the flight is to be performed, or to AMC Polska (Airspace Management Cell of the Polish Air Navigation Services Agency);
- xiv. in case of flights within building structures: as cleared by the facility operator and in accordance with agreed safety rules;
- xv. in addition, flights performed over:
  - closed areas,
  - nuclear facilities,
  - areas, facilities and devices referred to in Article 5 para. 2 point 1 letter a and b, point 2 letter a and b and point 3 letter a and b of the Act of 22 August 1997 on the protection of people and property (Journal of Laws of 2018, item 2142),
  - military units and firing ranges,
  - can be performed only as cleared and needed by the area/facility/device operator.
- xvi. flights over fuel pipelines, power lines and telecommunications lines, water dams and locks and other devices located in open area, the destruction or damage of which may endanger human life or health, the environment or cause serious material damage, is carried out with extreme caution;
- xvii. in case of flights related to safety and public order, security and defense of the state, protection of the state border, protection of the internal safety of the state or search and rescue, provisions regarding flights in Prohibited and Restricted areas covering airspace immediately above the area of the national park do not apply.

### What in the event of a failure

All technical devices may fail. However, such a situation in the case of UAV may carry a high risk, so in the event of UAV loss of control or UAV loss, the operator must immediately:

- a. notify the competent ATS unit by telephone, via electronic communication means or communication and information system, and attempt to regain communication with the UAV;
- b) provide the ATS unit with the following information: UAV current location identified by emergency location device, UAV last known location in the event of failure of the emergency location device, time of communication loss, last recorded speed, UAV altitude and heading, expected time to run out of fuel or depletion of power to the propulsion system.





## Romania

In Romania, unmanned aircraft systems (UAS) (or light drones), regardless of their mass and configuration (fixed or rotary wing) are assimilated to "aircraft". Their definition was made by translating the ICAO definitions.

The legislative framework applicable to flight activities involving such aircraft is:

1. The Romanian Air Code;
2. Government Decision no. 912/2010 regarding "the approval of the procedure for the authorization of flights in the national airspace as well as the conditions in which the take-off and landing of civil aircraft can be performed also on other land or water surfaces than the certified aerodromes";
3. RACR IA "Registration of Civil Aircraft"; (Romanian Civil Aviation Regulations - RACR)
4. RACR AZAC "Flight Admissibility of Certain Civil Aircraft Categories";
5. RACR OPS LAAG "Air work and general aviation";
6. DN 14-02-001 "Issue of Identification Certificates for Unmanned Civil Aircraft (UAV)".

The following table shows the documents required for the possession and use of UAS in Romania, at this time.

The document	The legal basis
<b>Certificate of identification.</b> National flight permit for aircraft with a maximum take-off mass of between 0.5 Kg and 15 kg (Application for issuance of identification certificate / inscription schemes for identification marks) Costs: 90 Euro + VAT at the official exchange rate of the NBR on the day of payment (the certificate has no validity limit)	RACR IA OMT no. 1338/25.10.2016 DN: 14-02-001 (Edition 2)
<b>National flight permit for aircraft with a maximum take-off mass of between 15 and 150 kg</b> Costs: <ul style="list-style-type: none"> <li>• 540 Euro + VAT at the official exchange rate of the NBR on the day of payment (the certificate has a validity term of 1 year) at initial issue;</li> <li>• 300 Euro + VAT at the official exchange rate of the NBR on the day of the payment, in case of prolongation;</li> </ul>	RACR-AZAC
<b>Liability insurance for third-party damaged (for aircraft with MTOM over 20 kg).</b> Costs: The CAA does not charge fees for this activity	EC no. 785/ 2004







<p><b>Operations authorizations:</b></p> <ul style="list-style-type: none"> <li>the authorization of flights below the minimum safety height;</li> <li>authorization provided by Ministry of National Defense in order to perform filming / aerial photography activities.</li> </ul> <p>Costs: The CAA does not charge fees for these activities.</p>	<p>GD no. 912/2010</p>
<p><b>Overflight authorization for operations in the Biosphere Reserve "Danube Delta"</b></p>	<p>Law no. 82/1993</p>
<p>In accordance with the provisions of Law no. 82/1993 "on the establishment of the Danube Delta Biosphere Reserve", with the subsequent modifications and completions, air operators intending to conduct VFR flights in the airspace of the Danube Delta Biosphere Reserve (in Class G airspace), including landings / take-offs in the areas allowed by the Danube Delta Biosphere Reserve Administration must request the Danube Delta Biosphere Reserve Administration to issue a permit. The issuing of the permit for overflight may be sent by post, fax or mail. The tariff is of 50 lei (11 Euro), according to the provisions of the Order of the Minister of Environment no. 610/19 May 2009 "approving the tariffs for the works and services provided by the Administration of the Danube Delta Biosphere Reserve at the request of natural and legal persons", with the subsequent amendments and amendments.</p> <p>Costs: Ro CAA does not charge rates for this activity</p>	

The legislative framework applicable to flight activities involving such aircraft is:

**A. Identification certificate**

In order to operate in the national airspace a UAS must have an identification or a registration document. If the operator requires the aircraft to be identified by the CAA, this is done according to the provisions of the Airworthiness Directive no. DN: 14-02-001. If the UAS holds a registration certificate or an equivalent document issued by another State, the CAA may recognize those documents.

**B. National flight permit for UAS with MTOM greater than 15 kg**

The requirements for the national flight permit are contained in the RACR-AZAC "Flight Admissibility of Certain Civil Aircraft Categories" Chapter VI "Unmanned Aerial Vehicles on Board (UAS)". The tariff for obtaining the National Flight Permit is 540 Euro / aircraft + VAT, (according to OMTI 1305/2012).

**C. Insurance, as per the law, for damage to third parties.**

- Ensuring for UAS whose MTOM is greater than 20 kg shall be carried out in accordance with Regulation (EC) No. No 785/2004 of the European





- Parliament and of the Council of 21 April 2004 on insurance requirements for air carriers and aircraft operators;
2. The provision of onboard unmanned powered aircraft with a maximum take-off mass of less than 20 kg is optional and the operation is at the sole responsibility of the operator;
3. Operators / owners of UAS with a MTOM of less than or equal to 500 grams shall not be required to hold an identification certificate issued by CAA.

#### **D. Operating Authorizations**

Where the requirements specified in subparagraphs (a), (b) and (c) above are met, depending on the operations it wishes to carry out, the operator must comply with the conditions, ask and obtain approvals and endorsements and conclude the protocols specified in GD no. 912/2010.

1. Meeting the conditions for which flights are considered to be authorized in the controlled airspace or Class G airspace (ATS Airspace Classification - ENR 1.4.);
2. National Ministry of Defense (MND) approval for aerial shootings / photos. The application shall be completed according to the form and submitted to the MND;
3. Approval for operation below minimum heights is required under the following conditions:
  - a. for operation below the height of 3000 m above Bucharest. The application shall be submitted to the MND;
  - b. for operation below safety heights above areas other than Bucharest. The application is filed with the CAA.
4. Approval for flight in the border area. Flights in the border area (comprising the area 30 km deep from the state border and the Black Sea coast) are executed in accordance with the provisions of OUG 105/2001
5. Take-off and landing clearance. Landing and take-off shall be carried out under the conditions stipulated by GD no. 912/2010 subject to obtaining the approvals, endorsements and conclusion of the specified protocols.

The conditions necessary for the possession and use of UAS in Romania are summarized in the following chart:

Regulated issues	Legal provisions in Romania	Notes
Regulatory framework	CAA's drone guide: <a href="http://www.caa.ro/media/docs/Ghid_RP_AS_Ed_2.pdf">http://www.caa.ro/media/docs/Ghid_RP_AS_Ed_2.pdf</a>	Responsible: Ministry of Transportation/CAA





How to poses legally a drone	After buying, must register it, with CAA		
How to fly legally a drone	Following the CAA's drone guide, from above		
Requirements on drones	Registration only		
Requirements on pilots	No		
Requirements for operation/flight:			
Registration	Yes,  YR-DXXXX	at RoCAA, 90 eur +VAT, for every drone with MTOM < 15 Kg 540 eur +VAT, for every drone with MTOM > 15 Kg	
Flight approval over other land and water surfaces, excluding certified airfields	Day	Yes	GD no. 912/2010
	Night	No	
	VLOS	Yes	
	BLOS	No	
	Under 122m	Yes	
	Over 122m	No	
	Into/over cities/crowds	No	
Aerial videos and pictures	Only with approval from Ministry of National Defense or CAA. - limited resolutions ( for LIDAR; - map scale over 1:20000.		







Flight under minimum safe altitude over cities	For under 3000m, from Ministry of National Defense; For the other cities, from CAA	
Flight on frontier area(30km from frontier)	Special approval from Frontier Police	
Flight over Danube Biosfera Reservation	Special Permit from Danube Biosfera Administration	
National flight permit	Only for >15kg MTOW	
Restricted areas	Yes Irbb.ro/fir.html	NOTAM, Ministry of National Defense
Privacy	Other laws	

### Authorities involved in regulation and oversight of drones operations

The Romanian authorities with attributions in the UAS field are:

- Ministry of Transportation, through the Romanian Civil Aviation Authority (Romanian CAA);
- Ministry of National Defense;
- Ministry of the Environment through the custodians of Natural Parks and Natural Reservations, including Danube Delta Biosphere Reserve.

### Enforcement measures

At this time, in Romania, there is no system of punishing those who commit crimes using drone. The drone being considered as a flight aircraft is subject to aviation specific legislation. The applicable penalties are provided in Chapter XIII - Civil Air Code.

Those who can report off-law use of the drones are:

- Owners of areas where flights take place;
- Police;
- CAA;
- Ministry of National Defense.





Punishment of the guilty is done with fines or imprisonment using general legislation.

The reported cases of abusive use of the drones are few, some of them being motivated by privacy breaches or political disputes.

Enforcement	CAA, Local police – fines and/or prison	20 000-50 000 RON/ 4 450-11 000Eur
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## State of Art of drones laws in Other Countries

### United Kingdom

The UK has a system of air navigation laws that apply to the use of drones. These regulations aim to ensure the safety of individuals around drones. There are stricter regulations in place for drones that carry a camera on board and record data. The rules are actively enforced by the Civil Aviation Authority. While no new legislative initiatives are currently pending, the UK is in the process of exploring additional options for the regulation of drone use.



### I. Introduction

Drones, frequently referred to as “small unmanned aircraft” in the UK, or unmanned aerial vehicles (UAVs), are a rapidly emerging technology that has gained considerable popularity over the past few years. They are covered under a patchwork of English laws, including aviation laws, which are regulated by the Civil Aviation Authority (CAA). Other areas of law that come into play, particularly if the drone has a camera mounted on it, are data protection, privacy, liability, insurance, export, and intellectual property laws, as well as the common-law torts of nuisance and trespass.

### II. Laws Regulating Drones

The primary piece of legislation that covers drones is the Civil Aviation Act 1982 and the Air Navigation Order 2009 made under the Act. Breaches of these aviation laws are criminal offenses, enforced by the CAA. There are also “rules of the air” that apply to airspace over the UK, as discussed below. These rules are similar to the Highway Code for roads.







It is the responsibility of the operator of the drone to ensure that the aircraft is flown safely and that applicable laws are complied with. Article 138 of the Air Navigation Order provides that any person undertaking aviation activity “must not recklessly or negligently cause or permit an aircraft to endanger any person or property.” The CAA policy requires that drones meet the same safety and operational standards as manned aircraft to ensure that they do not “present or create a greater hazard to persons, property, vehicles, or vessels . . . than that attributable to the operations of manned aircraft of equivalent class or category.”

The conditions contained in articles 166 and 167 of the Air Navigation Order specifically apply to small drones and permit them to be flown without complying with the other terms of the Air Navigation Order, such as airworthiness and flight-crew licensing requirements. These laws are intended to be “as ‘light touch’ and proportionate as possible, so there is a great deal that can be done (especially for private or recreational flights) without the need to approach the CAA at all.” Permission from the CAA is not required for flights that are not flown in return for any “valuable consideration,” provided the flight is not close to people and/or buildings.

### III. Restrictions

#### A. **Weight Restrictions – Aircraft 20 Kg and Under**

Aircraft that weigh 20 kilograms or less are covered by articles 166 and 167 of the Air Navigation Order. These articles provide basic safety measures, such as

- prohibitions on dropping articles or animals from the drone that would endanger persons or property;
- requirements that direct, unaided, visual contact be maintained that is sufficient to monitor the flight path of a small unmanned aircraft “in relation to other aircraft, persons, vehicles, vessels and structures for the purposes of avoiding collisions;”
- prohibitions on aircraft being flown above 400 feet in altitude or farther than 500 meters horizontally away from the operator without explicit permission from the Civil Aviation Authority; and
- requiring the operator to ensure that he or she only fly the drone if it can be done safely.

Drones with cameras attached must not be flown within 150 meters of a congested area or 50 meters of a person, vessel, vehicle, or structure that is not under the control of the pilot. This makes it difficult for people to fly UAVs with cameras inside parks or other public areas and remain in compliance with the regulations.

#### B. **Aircraft Over 20 Kg**

Unmanned aircraft that weigh between 20–150 kg are subject to all articles of the Air Navigation Order, and the operators of these aircraft are required to





obtain a certificate of airworthiness, have a permit to fly, have a licensed flight crew, and follow the rules of the air. If the operator is unable to meet all the requirements, he or she may apply to the CAA for an exemption under article 242 of the Air Navigation Order. Exemptions are issued on a case-by-case basis. As with aircraft under 20 kg, aircraft between 20–150 kg may not drop articles or animals, regardless of whether a parachute is used, that would endanger persons or property.

## C. **Geographical Restrictions**

As noted above, the UK has many restrictions on where drones can be operated that serve in practice to limit the available areas to use such devices. The Air Navigation Order provides that, without explicit permission from the CAA, drones may not be flown

- within 150 meters of, or over, a congested area;
- within 150 meters of, or over, an organized open-air assembly of 1,000 or more people;
- within 50 meters of any vehicle, structure, or vessel that is not under the control of the operator; or
- within 50 meters of any person not under the control of the operator.

In addition to these requirements, there are also a vast number of specified no-fly zones for drones. These fall into the following four categories:

- restricted areas that may never be flown over, such as prisons and nuclear power stations;
- controlled airspace that should not be flown into without explicit permission from air traffic control, which covers airports and airfields;
- “prohibited areas,” which are zones that operators are highly recommended against flying into for their safety and the safety of others, such as high-intensity radio transmission areas that could cause interference with the aircraft; and
- “danger areas,” which are locations used for military weapons and pilot training, as well as testing military equipment.

The Secretary of State has authority under the Air Navigation Order to make regulations to restrict or prohibit flying in certain areas if it is necessary in the public interest where there is a gathering or movement of a large number of people, an aircraft race, or a contest or flying display; for the purposes of national defense; or for any other reason that affects the public interest. Failing to comply with the regulations issued by the Secretary of State in these circumstances is an offense.

## D. **Commercial Use**

Any person that uses a drone for commercial purposes must obtain a license from the Civil Aviation Authority. To obtain the license, the operator must





demonstrate that he or she is sufficiently competent. The House of Lords estimates that there are tens of thousands of drones in the UK, with approximately 500 small drones under 20 kg licensed for commercial use. There are currently two units between 20–50 kg in commercial use in the UK.

**E. Insurance**

Most operators of aircraft that weigh over 20 kg are required to obtain adequate levels of insurance to cover their liability in case of an accident. Model aircraft under 20 kg are exempt from these requirements.

**F. Privacy Concerns**

The use of cameras on drones to record images, including people without their consent, poses issues of compliance with current laws. Recording such information could potentially breach the obligations contained in the Data Protection Act and the CCTV Code of Practice, which address certain aspects of the use of drones that collect information about individuals. While the Code of Practice distinguishes between private and commercial users, and notes that commercial operators must comply with data protection obligations, it further states that “it will be good practice for domestic users to be aware of the potential privacy intrusion which the use of [unmanned aerial systems] can cause to make sure they’re used in a responsible manner.”

The privacy and data protection obligations that arise can be further complicated if images are then posted on social media and evolve from private content into public content. A number of social networks state in their terms and conditions that they can license user content to third parties.

Any aircraft that is registered in any other country is not permitted to fly over the UK for the purposes of aerial photography or aerial surveys, regardless of whether valuable consideration is given for the flight, unless the operators have the permission of the Secretary of State and comply with the conditions attached to such permission.

**IV. Regulation of Drones Controlled by Multiple Operators**

No separate regulations were located that apply to the recreational use of drones controlled by multiple operators. All operators would be required to abide by the regulations of the Air Navigation Order and operate the drone within the limits of these laws.

**V. Requirements for Installation of Software During Manufacture to Prohibit Drones from Flying in Restricted Areas**

There does not appear to be a requirement for software to be installed in drones to prohibit them from flying into restricted areas, and the UK does not appear to use an “electric fence” linked to the frequencies of drones that would prevent them from entering a restricted area. While there is no requirement for this technology, some







major drone manufacturers are including the technology as part of the manufacturing process on their own initiative.

The UK focuses on existing legislation, which provides that flying a drone in a restricted area is an offense, and these offenses are actively investigated and prosecuted by the CAA.

## VI. Import and Export Requirements for Drones

Certain aspects of unmanned aerial vehicles are on UK's Strategic Export Control List, which, as its subtitle indicates, is a list of "strategic military and dual-use items that require export authorisation." UAVs capable of carrying a payload over a certain weight, or exceeding a distance of 300 km, may not be exported without a proper license. As relevant to this report, the Military List specifically includes and prohibits the export without authorization of

- c. Unmanned aircraft and related equipment, as follows, and specially designed components therefor:
  - 1. "UAVs", Remotely Piloted Air Vehicles (RPVs), autonomous programmable vehicles and unmanned "lighter-than-air vehicles";
  - 2. Launchers, recovery equipment and ground support equipment;
  - 3. Equipment designed for command or control;
- d. Propulsion aero-engines and specially designed components.

## VII. Allocation of Frequencies for Drones

Drones are considered to be model control equipment by Ofcom, the UK communications regulator, and are required to operate within certain frequency bands, as designated by Ofcom. Air model control devices are required to use frequencies (MHz) 34.945 to 35.305, and not exceed an effective radiated power of 100 mW. The 35 MHz band is solely dedicated to aeronautic modeling, and there is a prohibition on the use of airborne transmitters. Regulations require that model control equipment must not "cause undue interference to other wireless telegraphy equipment."

The use of these specific frequencies for model control is exempt from the requirement to hold a license under the Wireless Telegraphy Act 2006 as long as the model meets certain conditions, such as operating within the designated frequencies, and the equipment must be marked lawfully in accordance with the CE marking (which indicates European Union regulatory standards are met) and comply with all relevant EU directives. A license to operate is not required for equipment that complies with all applicable regulations.

These regulations are enforced by Ofcom, which prioritizes maintaining public safety communication services its top priority, and maintaining the safety of business radio and communications its second priority. For model control equipment, Ofcom aims to ensure that noncompliant radio equipment is kept off the market and that the use of





radio frequencies conforms to license requirements. Using equipment that does not meet the conditions of the license exemption is an offense under the Wireless Telegraphy Act. These offenses are investigated and prosecuted by Ofcom, and the penalties include a fine of up to £5000 (approximately US\$8,000) and/or six months' imprisonment. The courts may also order the confiscation of any property used in connection with the offense.

Ofcom has field operation teams that investigate and take action to prevent undue interference with frequencies. It may undertake enforcement actions, including informal warnings, formal cautions, or more formal criminal proceedings involving fines and imprisonment.

## VIII. Role of Local Authorities in Drone Regulation

The approach of local authorities towards the use of drones varies. Some local authorities appear not to have published any guidance on the use of drones in their localities. Other local authorities specifically require drone owners to comply with the Air Navigation Order and the CAA requirements for licenses for commercial flights.

Local authorities have the ability to introduce policies to regulate the use of drones on any land owned by the authority. For example, Leicester City Council prohibits the use of drones, both for recreational and commercial purposes, on City Council lands. The reason behind this policy is concern over the authorities' liability for any legal action as a result of the activities of a drone and its operator, including accident or injury and the close proximity of the land to private properties. Any person caught using a drone on the property of the local authority will be requested to stop. If they refuse, the police will be called and the person removed from the property in accordance with the by-laws.

## IX. Enforcement

The CAA is responsible for ensuring compliance with the Air Navigation Order and it works with the police and other agencies in carrying out this responsibility. The laws and regulations are being actively enforced by the CAA. A number of individuals have been prosecuted for violating the restrictions contained in the regulations.

The majority of enforcement actions by the CAA are aimed at individuals who use drones for commercial purposes and are not licensed. However, safety is the overriding concern of the regulations contained in the Air Navigation Order, and the CAA will take action against individuals using a drone for personal purposes when it causes a safety hazard.

In December 2015, the CAA announced that it would take action against individuals operating drones on a recreational basis if they did not follow the regulations—in particular the prohibition on flying over congested areas or within 50 meters of buildings or people without official permission. Failing to observe these regulations can result in a criminal prosecution and a fine of up to £5,000.





In the first conviction in the UK for a violation of aviation laws by a drone operator, the CAA prosecuted an individual in 2014 after he lost control of his drone near a nuclear submarine facility. The individual was subsequently convicted for dangerous use of a recreational drone. In May 2014 an individual was fined for flying a drone over rides at Alton Towers, an amusement park. Other prosecutions include the prosecution of an operator who flew drones with a camera over multiple premiere league soccer grounds, the Houses of Parliament, a memorial at Buckingham Palace, and parts of the River Thames. This individual was charged with breaching articles (2)(a), 166(3), and 167(1) of the Air Navigation Order. The defendant pled guilty to flying a small unmanned aircraft over a congested area and not maintaining direct visual contact with a drone. He was fined £1,800 (approximately US\$2,500), ordered to pay £600 (approximately US\$1,000) in costs, and required to forfeit his drones and cameras.

## Australia

Australia has regulated unmanned aircraft since 2002. The relevant regulations are being substantially revised in 2016, including new rules related to using remotely piloted aircraft (RPA) for nonrecreational purposes that come into force in September 2016. The new rules provide for commercial operations of very small RPA (weighing less than 2 kilograms/4.4 pounds) to be conducted without the need for a remote pilot license or operator's certificate, provided that these are operated under the standard conditions established in the new regulations. Small RPA (2–25 kilograms/4.4–55 pounds) will also be able to operate over a person's own land for certain purposes and under the standard conditions without the need for certification and a license, while the use of medium RPA (25–150 kilograms/55–330.7 pounds) for the same purposes and under the standard conditions will only require a remote pilot's license. Operators of large RPA, as well as smaller RPA for other nonrecreational purposes, will still be required to obtain a remote pilot license and operator's certificate. Large RPA must also have airworthiness certification.

To be eligible for a remote pilot license, operators must obtain certain qualifications, complete certain training, and have a minimum number of

## IMPORTANT SAFETY INFORMATION

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Congratulations on your purchase. We hope you have a lot of fun with it but there are just a few things you need to remember for everyone's safety.



You must only operate this aircraft in your line-of-sight in daylight. **Don't let it get too far away from you.**



You must not fly closer than **30 metres** to **vehicles, boats, buildings or people**



You must not fly over **any populous area**, such as beaches, other people's backyards, heavily populated parks, or sports ovals where there is a game in progress



If you are in controlled airspace, which covers most Australian cities, you must **not fly higher than 400 feet (120 metres)**



You should not fly within **5.5 km** of an **airfield**



**It's illegal to fly for money** or economic reward unless you have an unmanned operator's certificate issued by the Civil Aviation Safety Authority [CASA].  
Safe and happy flying!

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**Further information**  
 Model Aeronautical Association of Australia  
[www.maaa.asn.au](http://www.maaa.asn.au)

**CASA**  
 » Model aircraft: [casa.gov.au/sportaviation](http://casa.gov.au/sportaviation)  
 » Remotely piloted aircraft: [casa.gov.au/rpa](http://casa.gov.au/rpa)  
 » Phone: **131 757**

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hours of experience flying RPA. Entities wishing to obtain an operator's certificate to operate large RPA or smaller (nonexcluded) RPA for nonrecreational purposes must have the facilities, procedures, and personnel needed to operate the RPA safely.

There is currently some uncertainty with respect to the privacy rules applicable to the use of drone technology for collecting or recording information. In 2014, a parliamentary committee recommended a review of the relevant legislation, but no changes have been proposed to date.

## I. Introduction

The Australian Civil Aviation Safety Authority (CASA) states that "Australia was the first country in the world to regulate remotely piloted aircraft, with the first operational regulation for unmanned aircraft in 2002." The current rules related to remotely piloted aircraft (RPA) and model aircraft are contained in Part 101 of the Civil Aviation Safety Regulations 1998 (Cth) (CASR).

CASA is currently working to modernize the regulations and expects to complete a full rewrite by the end of 2016. To achieve this, two "post-implementation review" projects have been initiated with respect to Part 101.

### A. US 14/18 – Review of Certain Aspects of Part 101

The objectives of this project include to review the provisions in the regulations related to model aircraft in terms of their "effectiveness in managing emerging risks associated with use of unmanned aircraft which fall outside the scope" of the provisions on large and commercially-used RPA, and to generally review all of Part 101 other than the large and commercially-used RPA provisions.

### B. OS 11/20 – Review of Regulations and Guidance Material Related to Unmanned Aircraft Systems (UAS)

The objective of this project is to "provide an up to date regulation and more comprehensive guidance to industry on the regulatory requirements and approval processes for the commercial operation of RPAS [remotely piloted aircraft systems] in Australia." [6] It is being conducted in two phases. Phase 1 involves amendments to Part 101 of the CASR and the publication of a suite of advisory circulars to provide guidance to industry. The process included the development of a notice of proposed rulemaking (NPRM), which was released in 2014, with people able to submit comments on the proposed changes to Part 101.

On March 24, 2016, an amending regulation, the Civil Aviation Legislation Amendment (Part 101) Regulation 2016 (Cth) (2016 Regulation), was promulgated. The amendments will come into force on September 29, 2016. CASA states that the amendments "reduce the cost and legal requirements for lower-risk remotely piloted aircraft (RPA) operations. More complex operational matters will be dealt with in a new manual of standards to be developed with





industry, providing greater flexibility and responsiveness in this rapidly evolving area.”

This report outlines the rules contained in Part 101, as amended by the 2016 Regulation.

Phase 2 of the project “will consist of a complete re-write of the regulation resulting in a new CASR Part 102 for RPAS.”

## II. CASR Part 101

There are currently three subparts in Part 101 of the CASR that specifically regulate different sizes and uses of RPA and model aircraft: Subpart 101.C contains provisions that are applicable to unmanned aircraft generally; Subpart 101.F, as amended by the 2016 Regulation, applies to the operation of “large” RPA and of “very small,” “small,” and “medium” RPA for purposes other than sport or recreation; and Subpart 101.G relates to model aircraft, which are only used for recreational purposes. Subpart 101.A also contains some preliminary provisions relevant to operating RPA, and Subpart 101.B includes a general prohibition on the unsafe operation of unmanned aircraft.

The 2016 Regulation will insert a new Subpart 101.AB that provides for the general authorization for people supporting the operation of model aircraft and RPA. As noted above, 2016 Regulation also provides for CASA to issue a “Manual of Standards” prescribing matters required or permitted by the regulations, or that are otherwise “necessary or convenient” to be prescribed in terms of giving effect to Part 101. Other changes include the following:

- Changing the terminology relating to unmanned aircraft from “UAV” (unmanned aerial vehicle) to RPA, to align with that used by the International Civil Aviation Organization;
- Creating new weight classifications for RPA, being “very small” (less than 2 kilograms/4.4 pounds), “small” (2–25 kilograms/4.4–55 pounds), “medium” (25–150 kilograms/55–330.7 pounds), and “large” (more than 150 kilograms/330.7 pounds);
- Introducing the concept of “excluded RPA,” which relates to RPA operations considered to be of lower risk, as determined by RPA category and operational use, and that will consequently have reduced regulatory requirements. Establishing a set of standard RPA operating conditions, which must be complied with in order for certain operations to be considered excluded RPA operations;
- Establishing a new system that allows very small RPA to be operated for commercial purposes without the need for prior certification or licensing, provided certain conditions are met.

The amendments prohibit autonomous flights “until such time as suitable regulations can be developed by CASA.” However, the explanatory statement accompanying the





2016 Regulation states that “there is scope for autonomous flight to be approved by CASA on a case-by-case basis in the meantime.”

## A. **General Operating Rules: Subpart 101.C**

Subpart 101.C applies to unmanned aircraft of all kinds, except control-line model aircraft and model aircraft flown indoors. It provides that, in order to legally operate any unmanned aircraft, the following requirements must be met:

- The aircraft may not be operated in or over a prohibited or restricted area, unless permission is obtained from the relevant authority controlling the area;
- The aircraft may be operated at an altitude greater than 400 feet above ground level only in designated areas of controlled airspace and in accordance with air traffic control clearance. Under the 2016 Regulation, the Manual of Standards “may prescribe requirements relating to the operation of unmanned aircraft in controlled airspace”;
- The aircraft must be operated within the operator’s visual line of site, unless approval is granted by the CASA;
- The aircraft may only be operated at an altitude above 400 feet within three nautical miles of an airfield if permitted by the regulations or is otherwise granted by the relevant air traffic control service or by the CASA.;
- The aircraft may also be operated above 400 feet in approved areas;
- A person must not cause any item to be dropped or discharged from the aircraft in a way that creates a hazard to another aircraft, person, or property;
- The aircraft must be operated in visual meteorological conditions, or in instrument meteorological conditions with appropriate approvals;

## B. **Operating Large RPA and Operating Other RPA for Non-recreational Purposes: Subpart 101.F**

As noted above, Subpart 101.F (as amended) applies to the operation of very small, small, and medium RPA “other than for the purpose of sport or recreation,” and to the operation of any large RPA. In many circumstances, the person actually operating such RPA must hold a “remote pilot license” and the relevant entity must hold a certificate authorizing the operation (currently referred to as a UAV operator’s certificate or UOC). Under the 2016 Regulation, these requirements will not apply if the operation involves an “excluded RPA.”

All operators of RPA covered by Subpart 101.F, other than those operating very small RPA, must also hold a “relevant qualification” related to the use of aeronautical radio, and must maintain a “listening watch” on a specified frequency or frequencies, as well as making required broadcasts at specified intervals.







In general, RPA must not be operated within 30 meters of a person “not directly associated with the operation” of the RPA. The 2016 Regulation creates new exceptions to this rule, stating that it does not apply if the person is standing behind the RPA while it is taking off, or to very small, small, and medium RPA where the person has consented and the RPA is operated no closer than 15 meters to him or her.

The amendments also provide for the Manual of Standards to prescribe requirements relating to the operation of RPA in certain areas.

## 1. **Excluded RPA**

For the purposes of Subpart 101.F, the 2016 Regulation provides that “excluded RPA,” for which operators are not required to obtain the license and certification referred to above, include the following:

- a micro RPA, being an RPA with a gross weight of 100 grams or less;
- a very small RPA if it is being operated for the purpose of sport or recreation or in standard RPA operating conditions;
- a small RPA if it is being operated by or on behalf of the owner of the RPA, over land that is owned or occupied by the owner of the RPA, in standard RPA operating conditions, and for certain listed purposes (such as aerial spotting or photography, agricultural operations, communications retransmission, carriage of cargo) for which no remuneration is received by anyone involved in the operation;
- a medium RPA in accordance with the same terms as for a small RPA, above, except that the person operating the RPA must also have a remote pilot license;
- a small or medium RPA being operated for the purpose of sport or recreation, or if it is being operated in standard RPA operating conditions by a person for the purpose of meeting the experience requirement for the grant of a remote pilot license, or by the holder of such a license for the purpose of getting practical experience and gaining competency in the operation of an RPA;
- an RPA being operated for the purpose of receiving training from an RPA operator who holds an operator's certificate;

## 2. **Standard RPA Operating Conditions**

The 2016 Regulations sets out the following as being the standard RPA operating conditions:

- the RPA is operated within the visual line of site of the operator;
- the RPA is operated at or below 400 feet above ground level during the day;
- the RPA is not operated within 30 meters of a person not associated with the operation of the RPA;





- the RPA is not operated in a prohibited area, certain restricted areas, over a populous area, or within three nautical miles of the movement area of a controlled airfield;
- the RPA is not operated over an area where a public safety or emergency operation is being conducted, unless approval is granted by the person in charge of the operation;
- the person operating the RPA operates only that RPA;

### 3. **Operating Large RPA**

In addition to the requirements for a remote pilot's license and operator's certificate, large RPA may only be operated if the operator has been issued a special certificate of airworthiness or an experimental certificate. Furthermore, large RPA can only be operated with the specific approval of CASA, which may impose certain conditions, such as requiring that the RPA stay within a specified area or prohibiting its operation at night.

RPA for which a certificate of airworthiness has been issued must not be operated in a populous area "at a height less than the height from which, if any of its components fails, it would be able to clear the area," unless granted approval from CASA. Before granting such approval, CASA must be satisfied that the operator of the RPA "will take proper precautions to prevent the proposed flight being dangerous to people and property."

The regulations also require that maintenance be carried out on large RPA in compliance with provisions in the Civil Aviation Rules 1988 (Cth) applicable to Class B aircraft.

### 4. **Operating Other RPA for Nonrecreational Purposes**

The regulations state that a very small, small, or medium RPA used for a nonrecreational purpose may be operated outside of an approved area if it stays clear of populous areas and, if it is to be operated above a height of 400 feet, the operator has obtained CASA's approval to do so. Approval cannot be granted to operate such RPA "over a populous area at a height less than the height from which, if any of its components fails, it would be able to clear the area."

As indicated above, unless it is an excluded RPA, persons operating an RPA for nonrecreational purposes must first obtain a remote pilot license and the relevant business must have an operator's certificate. Excluded RPA include very small RPA operated in standard operating conditions.

The 2016 Regulation also inserts new provisions regarding the operation of very small RPA (i.e., weighing less than 2 kilograms/4.4 pounds) for "hire or reward," which require an operator to notify CASA at least five business days before first conducting the operation. Such operations, in order to avoid certification and licensing requirements, must still be conducted under the standard RPA operating conditions, including with





respect to height, distance from people, and distance from controlled airfields;

## 5. Remote Pilot Licenses

The regulations set out what must be included in an application for a remote pilot license and the eligibility criteria for granting a license. The eligibility criteria, as amended by the 2016 Regulation, require a person to have passed one of certain types of examinations or components of training courses related to aviation theory or aeronautical knowledge, to have completed one of certain types of training courses related to the operation of the RPA that he or she proposes to operate, and to have at least five hours experience in operating an RPA under standard RPA operating conditions.

Remote pilot licenses may be subject to conditions related to the type of RPA that a license holder may operate and the areas where he or she may operate RPA, or requiring that he or she only operate RPA in visual meteorological conditions. The 2016 Regulation sets out particular conditions that must apply to the licenses, which relate to additional requirements for certain qualifications in order for the license holder to operate RPA in particular ways, such as above 400 feet in controlled airspace or outside of his or her visual line of sight;

## 6. RPA Operator's Certificate

The regulations also set out the requirements for applications for certification as an RPA operator and the eligibility criteria for granting certification. The eligibility criteria require the operator to show that the company or other legal entity has

- “an organisation and structure that is appropriate for safe operation of RPA”;
- “enough qualified and experienced personnel to undertake the proposed operations safely”;
- “facilities and equipment appropriate to carry out the proposed operations using [RPA] of the type to be used”;
- “suitable documented practices and procedures to do so, including practices and procedures for the maintenance of the operator's RPASs”; and
- “nominated suitable persons to be its chief [RPA] controller and maintenance controller.”

Various conditions are imposed on an operator's certificate, including that the person “maintains within its organisation a position of chief remote pilot” with certain minimum functions and duties. These functions, which are inserted by the 2016 Regulation, include “ensuring the operator's RPA functions are conducted in accordance with the civil aviation legislation,”







maintaining a record of the qualifications of each person operating RPA and monitoring their operational standards and efficiency, and maintaining a library of operational documents required by CASA.

In the past ten years, the number of certified drone operators has grown from about twenty-five to 500 (as of March 31, 2016);

### C. **Operating Model Aircraft: Subpart 101.G**

A “model aircraft” is defined as “an aircraft that is used for sport or recreation, and cannot carry a person.” Subpart 101.G applies to the operation of such aircraft weighing 100 grams or more, except control-line model aircraft and model aircraft flown indoors.

A person can operate a model aircraft only in good visibility, or at night in accordance with the written procedures of an approved organization. He or she must ensure that the aircraft remains at least 30 meters away from other people. Outside of approved areas, a model aircraft can be flown above a height of 400 feet if the operator keeps it in sight and keeps it clear of populous areas. “Giant model aircraft,” being model aircraft weighing between 25 and 150 kilograms, may only be operated in accordance with the rules and procedures of an approved organization or an approval given by CASA.

## III. **Enforcement and Penalties**

CASA is responsible for enforcing the provisions in the Civil Aviation Act 1988 (Cth) and the CASR. Various criminal offense provisions that may be relevant to the operation of unmanned aircraft are contained in the Act. For example, a person who operates an aircraft without a certificate of airworthiness, where such a certificate is required by the regulations, may be subject to a penalty of imprisonment for two years. The same penalty can be applied to flying an aircraft without a required license or other authorization.

In terms of regulatory offenses, as noted above, Subpart 101.B sets out a general prohibition on the operation of any unmanned aircraft “in a way that creates a hazard to another aircraft, another person, or property.” Breaching this prohibition is a strict liability offense that is subject to a penalty of 50 penalty units. Under Australian federal law a penalty unit is currently AU\$180, making the fine for this offense AU\$9,000 (about US\$6,815).

Other offenses accompany many of the provisions referred to in this report. For example, a fine of 50 penalty units may be imposed for not complying with a requirement related to the operation of an unmanned aircraft in controlled airspace or prescribed areas; operating an unmanned aircraft outside of the operator’s visual line of site, without a remote pilot license, or without an RPA operator’s certificate; breaching a condition of a license or certificate; or operating a very small RPA for hire or reward without notifying CASA.





Offenses in the regulations that are subject to a fine of 25 penalty units (AU\$4,500, about US\$3,408) include operating an unmanned aircraft above a height of 400 feet within three nautical miles of an airfield, dropping or discharging things in a way that creates a hazard to another aircraft or to a person or property, operating in prohibited visual conditions, and operating an RPA in controlled airspace without holding an aeronautical radio operator certificate.

#### IV. Application of the Privacy Act 1988 (Cth)

The CASR do not specifically address the use of camera, audio recording, or other surveillance equipment on unmanned aircraft. The Privacy Act 1988 (Cth) is a federal law that “regulates the handling of personal information about individuals.” It contains thirteen Australian Privacy Principles setting out “standards, rights and obligations for the handling, holding, use, accessing and correction of personal information (including sensitive information).”

The Office of the Australian Information Commissioner has published correspondence with the Attorney-General from 2012 and 2013 relating to the current privacy laws and their application to surveillance or recording of information using drones. The correspondence notes that the obligations in the Privacy Act 1988 (Cth) only apply to federal government agencies and certain private sector organizations; they does not apply to persons acting in an individual capacity. However, in addition to the CASR, other federal and state laws could potentially apply to the use of drones by individuals to photograph or record personal information. The Attorney-General stated that she would contact state and territory governments to seek their views regarding the adequacy of current legislation in regulating the use of surveillance drones.

In 2014, a parliamentary committee conducted a series of roundtable discussions and hearings regarding drones and privacy. The committee’s report recommended that CASA and the Australian Privacy Commissioner review the adequacy of the privacy and air safety regimes in relation to RPA. To date, no changes to the relevant laws have been announced.

#### Israel

Israel’s Aviation Law regulates the operation and manufacturing of all aircraft, including unmanned aircraft (UA) in Israel. The Law imposes licensing requirements on flight operators, aviation instructors, manufacturers, and all other persons engaged in aviation. Israel’s Civil Aviation Authority (CAA) controls the licensing and

**כללים להטסת טיסונים מסוג רב-להב (רחפון)**

סיכונים רבים קיימים בהטסת רחפונים. יש להקדים מספר דקות וקרא בעיון את הדברים הבאים כדי שתוכל להטיס בבטחה ובנאמנות.

הטסת רב-להב - כללי עשה ואל תעשה	עשה
אל תטיס ליד שדות תעופה או בקרבת מטוסים באוויר.	קרא את חוברת ההפעלה של הרב-להב והקפד על כללי הבטיחות של היצרן.
אל תטיס בתוך שכונות מגורים, ליד מבני ציבור, או התקהלות בני אדם, הנתחזק לפחות 250 מטר.	הטס על פי מנגנון החוק.
אל תטיס מעל או בקרבת אנשים.	הטס בקשר עין בלבד!
אל תטיס באזורים אסורים (מיקום אזורים אסורים ניתן למצוא באתר רת"א).	גובה מירבי להטסה 50 מטר מעל פני השטח.
אל תטיס בצורה פזיזה שמסכנת חיים או רכוש.	התרחק 2 ק"מ לפחות ממסלולי שדות תעופה.
אסורה עבודה מסחרית ללא רישיון.	הצטרף לבעל רישיון להפעלת טיסונים כדוגמת קלוב התעופה הישראלי וקבל הדרכה בהטסת הטיסון.

את הנחיות המעגיות בהטסת טיסונים ניתן למצוא בדפוסות הטיס (הנחיות כלליות לטיסון), תחילת 1981 - באתר רשות התעופה האזרחית (רת"א), בקישור [caa.gov.il](http://caa.gov.il).





supervision of civilian flight operations, and maintains a special unit for UA operations. The CAAI has issued a number of directives to regulate various aspects of UA activities, including flight altitude and authorized routes, required transmission devices, and procedures for the preapproval of flights.

In addition to issuing operational directives, the CAAI has published a draft proposal for registration of UA. The proposed register would include all UA owned by Israeli citizens or by Israeli corporations that have received authorization to deal with UA in Israel. The proposal also calls for labeling UA with information confirming their Israeli registration, the name of manufacturer, and the registration number. In addition, the proposal would require fire-resistant license plates in all UA. The plates would contain specific identifying information including aircraft type, model, and serial number, as well as UA authorization status.

A concept paper issued by the CAAI incorporates licensing requirements under Circular 328 AN/190 of the International Civil Aviation Organization regarding UA systems. The concept paper calls for the issuance of UA licenses for various aviation operators, depending on flight type, category, and class.

Flying any aircraft, including UA, in Israeli airspace is subject to spatial and geographic restrictions. In addition to aircraft, the restrictions apply to unmanned powered or unpowered air devices weighing at least 300 grams (0.66 pounds), which are used or designed to be used for sports and leisure purposes.

## I. Introduction

Having pioneered the modern use of unmanned aircraft (UA) for intelligence gathering and target identification in the mid-1970s, Israel was reportedly the world's largest exporter of UA between 2010 and 2014. Foreign UA sales from 2005 to 2012 by Israeli companies were estimated at over US\$4.5 billion. In addition to developing UA for military uses, several Israeli startups are currently working on exploring civilian uses for UA and on finding ways to make UA technology safe, simple, and affordable. According to Israel's Civil Aviation Authority (CAAI), fifteen companies are now engaged in developing unmanned aircraft, and more than thirty platforms are in different stages of development.

UA operations are subject to the application of the Aviation Law, 5771-2011 and related regulations. Since the first UA flight in the mid-1970s, flight approvals for all unmanned aircraft in Israel have been controlled by the Israeli Airforce. With the increased volume of experimental flights conducted by Israeli defense industries engaged in UA development for the Israeli Defense Force (IDF) and for foreign clients, the Airforce has reportedly decided to direct requests for civilian flight approval to the CAAI. This has resulted in a comprehensive review of relevant legislation on UA operations in Israel.

In February 2005 the Knesset passed Israel's Civil Aviation Authority Law, 5765-2005. This Law establishes the CAAI as an agency under the Ministry of







Transportation. The CAAI is responsible for improving, regulating, and developing civil aviation in Israel in accordance with Israeli aviation laws. The CAAI maintains a special unit for unmanned aircraft systems under the Department for Aerial Control. The CAAI has issued a number of directives to regulate various aspects of UA flight operations.

## II. Licensing Requirements

The Aviation Law regulates the operation of all “aircraft.” According to the definition provided by the Law, an aircraft is any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth’s surface, excluding “paragliding tools” (PTs).

Unlike PTs, UA are subject to the general provisions that apply to all “aircraft.” According to the Aviation Law, any person who “engages in an aviation profession,” including by flying, conducting aircraft quality inspections, or providing aviation instruction or air control services, is required to be licensed. The Law authorizes the Minister, with the approval of the Knesset (Parliament) Finance Committee, to adopt rules for the grant of aviation professionals’ licenses. Items that may be considered for licensing include the applicant’s age, proof of subject-matter knowledge, training and testing, medical certification, and criminal record.

Aircraft operators must meet the specific requirements in their licenses. To receive a license, operators of commercial aircraft must meet certain conditions, including residence in Israel while not having his/her primary business located abroad, or Israeli citizenship when the licensee’s primary business is located in Israel. In the case of a corporation, a license to operate commercial aircraft will only be issued if the corporation is incorporated in Israel; does not have its primary business activity outside of Israel; and is controlled by an Israeli citizen, an Israeli permanent resident, or another person in accordance with the provisions of an international aviation convention [the 1944 Convention on International Civil Aviation, including supplements and amendments as ratified by the State of Israel] to which Israel is a party. Additional requirements for licensing of commercial operations include possession of the aircraft and necessary equipment for its operation, and authorization for flying and landing in designated areas in Israel.

In addition to regulating the operation of aircraft, the Aviation Law requires registration and preapproval of the use of any “flight auxiliary facility” (FAF). The Law defines an FAF as any device located outside of the aircraft that is used to assist the operation of the aircraft, including by navigation and flying. The Law also imposes licensing requirements on the manufacture of all aircraft, including UA. Among the conditions for the issuance of a manufacturing license are the availability of equipment necessary for the production of aircraft and the operation of a system of quality control by the manufacturer. The Law further authorizes the Minister to issue regulations regarding specific aspects of the design and production of aircraft.





### III. Spatial Restrictions

The Aviation Law authorizes the Minister of Transportation and Road Safety, with the consent of the Minister of Defense, or the government in the absence of such consent, to designate areas for flights of civilian and military aircraft. The decision regarding coordinates and routes through which aircrafts would enter, pass through or exit Israeli airspace, will similarly be made by the Ministers, having consulted with the Minister of Environment Protection, and by the government, in the absence of such consent.

The Aviation Regulations (Operating Aircraft and Aviation Rules), 5742-1981, issued by the Minister, accordingly divide Israel's Flight Information Region into areas where flying is permitted, areas where flying is prohibited or restricted, and areas that are considered dangerous. The geographic restrictions under the regulations apply to all aircraft, including UA. The restrictions also expressly provide that they are applicable to unmanned powered as well as unpowered air devices of at least 300 grams (0.66 pounds), which are used or designed to be used for sports and leisure purposes.

Among those areas where flying under a specified altitude is prohibited are designated natural reserves and antiquities, locations of refineries and a power plant, the Biological Research Institute in Nes Tsiona, and firing ranges. Flying over the Temple Mount in Jerusalem is completely prohibited for all aircraft at any altitude except for commercial flights in aviation routes to and from the Ben Gurion International Airport flying 8,000 feet above sea level. In the case of other areas in Jerusalem, flying at 4,000 feet or higher may be authorized subject to satisfying security procedures at the airport, the use of an Israeli pilot who has completed special training at the Ministry of Transportation Security Department, and the preapproval of a detailed authorization request by that Department. Flying over the nuclear reactor in Dimona is completely prohibited at any altitude. A full prohibition similarly applies to flying over Gaza at any altitude.

Areas where flying is restricted include certain firing ranges during weekdays. The rules also designate two areas where flying is dangerous, and prohibit flying within specific distances from Israel's borders. Special requests to deviate from geographic restrictions other than those regarding distances from the borders may be submitted to the CAAI's operations unit for approval.

### IV. Regulation of UA Flights

UA flight operations are subject to specific rules issued by the CAAI. Accordingly, except for takeoff and landing, or by special prior approval, UA flights over a populated area can be conducted only at 5,000 feet or higher. Experimental flights also require prior approval. The rules prohibit the simultaneous remote operation of more than one UA by the same operator from the same remote pilot station in the absence of special authorization. Special rules also apply to ensure that the UA operator maintains control over the UA flight at all times, and to generally prevent the flying of UA in air space where manned aircraft fly.





The rules require that specific equipment be located in or on the UA as well as in the pilot station during flight. For example, a UA is generally required to have a properly operating transponder. A communication signal and a code for identification of the transponder must be defined for every UA flight. A flight manual and radio devices with certain reception and transmission abilities must be located at the pilot station. Additional rules apply to flight procedures and flight approval requests.

The CAAI has assigned specific geographic parameters to areas navigated by UA. Maps for UA flight routes are provided on the CAAI website.

CAAI directives further define and assign direct responsibility for UA flight operations, determine the range that must exist between a UA and its transponder, specify the information that must be included in a request for flight approval, regulate automatic take-off and landing systems for UA, and establish safety transportation procedures, among other matters.

## V. Registration and Labeling of UA

In preparation for specific regulations on the subject, the CAAI has published a draft proposal for registration and labeling of UA. Among the proposal's objectives are the encouragement of the use of UA for commercial activities by facilitating proof of ownership, providing the state with the ability to prevent the use of UA by criminal or terrorist players, encouraging proper operation by enabling third parties to identify and complain about improper UA use, and facilitating UA identification for purposes of investigating accidents.

According to the proposal, the CAAI would maintain a register of all UA based on proof of ownership. Registration of UA would be authorized only for Israeli citizens or corporations that have received authorization to deal with UA. The registration of foreign-registered UA, however, would be prohibited, and UA sold to foreign countries would be deleted from the register.

The proposal also calls for labeling of UA in a way that would confirm that they were registered in Israel, providing the name of the manufacturer, and providing their specific registration number. The registration number would be removed, however, if the UA were sold to a foreign country. A conspicuous label is further proposed for any UA authorized to fly outside of a designated area and/or that weighs more than 200 kilograms (about 441 pounds) at the time of takeoff.

In addition to general labeling, the proposal provides for the mandatory placement of a fire-resistant license plate in each UA. The license plate would contain identifying information on the type of UA system, model number, date of manufacture and identification of the manufacturer, numbers correlating to the relevant serial and UA authorization, and other information as required.







## VI. Licensing of UA Flight Operators

A concept paper published by the CAAI Unit for Unmanned Aircraft Systems incorporates the requirements provided by Circular 328 AN/190 of the International Civil Aviation Organization (ICAO), titled **Unmanned Aircraft Systems (UAS)**, into a regulatory proposal.

In addressing UA personnel licensing, the concept paper quotes the ICAO Circular as follows:

Personnel licensing provides harmonization within a single airspace as well as across national and regional boundaries. The remote pilot of a UAS and the pilot of a manned aircraft have the same ultimate responsibility for the safe operation of their aircraft and therefore have the same obligation for knowledge of air law and flight performance, planning and loading, human performance, meteorology, navigation, operational procedures, principles of flight and radiotelephony. Both pilots must obtain flight instruction, demonstrate their skill, achieve a level of experience, and be licensed. They must also be proficient in the language used for radiotelephony and meet medical fitness levels, although the latter may be modified as appropriate for the UAS environment.

Accordingly, the concept paper proposes that flying a UA should require a license containing a specified authorization for the type of activity and equipment involved. Such a license would either be issued by the CAAI or by an ICAO member country, with authorization provided by the CAAI. Conditions for the issuance of flight licenses would include a minimum number of prior takeoffs and landings, depending on the type of flight. A license limited to flying subject to “visual line of sight” (VLOS), for example, would generally be issued only for flying a UA for commercial objectives if the operator had conducted at least three takeoffs and landings in the ninety days preceding the flight. The type of licenses issued would be based on the characteristics of the operator (trainee, flyer of a UA subject to VLOS, UA flyer, and UA instructor); on the type of flight (domestic, external, experimental); and on the UA type, category, and class.

## VII. Enforcement

As UA are considered “aircraft” for purposes of applying Israeli aviation legislation, the violation of licensing requirements enumerated in the Aviation Law results in the same penalties that apply to manned aircraft. Such penalties range from imprisonment for a period of one to five years to administrative fines rendered by the CAAI. An order to pay a fine is appealable to the circuit court.

The CAAI has extensive authority to issue and withdraw licenses provided to flight operators. The CAAI’s enforcement authority also extends to the prevention of imminent danger to personal or public security, and to property.





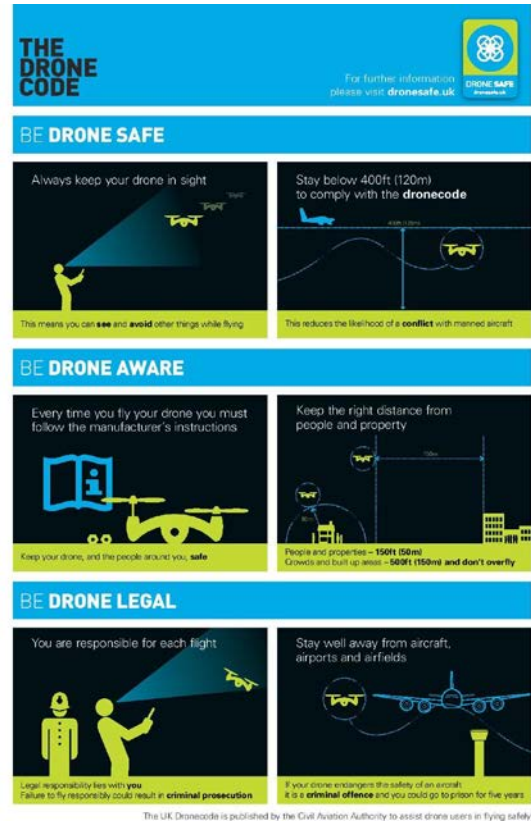
## Ukraine

Despite the widespread use of unmanned aerial vehicles (UAVs) in Ukraine, no active steps to regulate the use of drones have been taken. The only special rule applicable to drones is found in the Regulation on the Use of Airspace of Ukraine, which requires that those who use drones for aerial photography obtain special permission for UAV flights from the State Aerial Department and coordinate their flights with the General Headquarters of the Armed Forces. This is in keeping with the Convention on International Civil Aviation of 1944, which Ukraine joined in 1992. Apart from this rule, the general aviation regulation regime is applicable to UAV operations.

### I. Introduction

The Ukrainian unmanned aerial vehicle (UAV) industry is relatively young. Serious research in the field of drones started in the country in the early 2000s. Presently, about thirty variations of domestically manufactured UAVs are available for commercial use in Ukraine. In 2015 about 1,500 drones were reportedly being used for commercial purposes in the country.

A remote vehicle pilot training program was started in Ukraine in August 2014. Its curriculum was designed to provide future drone pilots a general theoretical knowledge in the design, function, and operation of unmanned aircraft systems (UAS) as well as practical skills for piloting a UAV with the active use of an autopilot. This program complies with the pilot training program of piloted aircraft and is approved by the Civil Aviation Administration of Ukraine. It is also coordinated with other programs of domestic and foreign organizations dealing with UAV pilot training. In 2016, Ukraine began manufacturing its own military drones.



### II. Legislation on UAV

#### A. Legal Framework

The legal status of drones is not specifically determined by Ukrainian law. Instead, general aviation regulations are applicable to UAV operations. The main legal acts regulating air traffic and the use of air space and aerial vehicles are the following:





- the Air Code of Ukraine, a national law that establishes all major norms concerning the use of the airspace of Ukraine;
- the Rules of Civil Aircraft Registration in Ukraine, which defines the procedure and requirements for maintaining the State Registry of Civil Aircraft of Ukraine and rules for registration and re-registration of new, modified, and repaired aircraft in the possession of legal entities and persons resident in Ukraine;
- the Regulation on Use of the Airspace of Ukraine, which establishes procedures for using airspace by legal and physical persons, and defines the functions of the airspace and air traffic control authorities.
- the Rules of Civil Aircraft Flights in the Airspace of Ukraine, which provides general regulation of flights and the maneuvering of aircraft, including in the classified air space of Ukraine and the airspace over the high seas, where the responsibility for air traffic control services is assigned to Ukraine by international agreements;

## B. Definition of UAV

According to the Air Code of Ukraine the term “unmanned aerial vehicle” is defined as any aircraft intended to fly without a pilot on board. The flight and control of such vehicles are performed by a special control station not located onboard the vehicle. The Rules of Civil Aircraft Registration state that UAV include unmanned, untethered balloons and remotely piloted aircraft;

## III. Registration of UAV

The Rules of Civil Aircraft Registration provide that an aircraft must be included in the State Registry of Civil Aircraft of Ukraine if it is owned by a legal entity incorporated in Ukraine or a natural person resident in Ukraine, or rented or leased by a Ukrainian operator from the nonresident owner. Unmanned, untethered balloons without a payload and remotely piloted aircraft having a maximum take-off weight not exceeding 44 lb (20 kg) that are used for entertainment and sports activities are not subject to registration in the State Registry. The Air Code states that these types of unregistered aircraft must be governed by rules established by professional organizations regulating this type of activity.

## IV. Air Navigation Restrictions

The Regulations on the Use of Airspace of Ukraine and the Rules of Civil Aircraft Flights in the Airspace of Ukraine do not mention drones specifically, but all rules applicable to piloted aircraft apply to UAVs if they are subject to aircraft registration.

The only special rule applicable to drones was found in paragraph 74 of the "Regulation on the Use of Airspace of Ukraine, which requires that those who use drones for" aerial photography obtain special permission for UAV flights from the State Aerial Department and coordinate their flights with the General Headquarters of the Armed Forces. This requirement appears to be in compliance with the







Convention on International Civil Aviation of 1944, which states that: "no aircraft capable of being flown without a pilot shall be flown without a pilot over the territory of a contracting State without special authorization by that State and in accordance with the terms of such authorization. Each contracting State undertakes to insure that the flight of such aircraft without a pilot in regions open to civil aircraft shall be so controlled as to obviate danger to civil aircraft. Ukraine joined the Convention in 1992.

The Ukrainian State Air Traffic Service Enterprise (UkSATSE), a government institution responsible for providing air traffic control across Ukrainian airspace and over the Black Sea, provides airspace management, air traffic flow management, en route meteorological services for air navigation, and preflight information services. UkSATSE is responsible for designating and reserving airspace where unmanned flights can be performed. Requests from drone users are to be submitted to UkSATSE.

While current Ukrainian legislation does not regulate the use of drones specifically, the Air Code of Ukraine and the Rules of Civil Aircraft Registration mention UAVs among civil and commercial aircraft. This means that rules and air navigation restrictions apply to all users of the airspace, including drone operators.

Civil aircraft are not allowed to fly over the following areas:

- Special Use Airspace – areas established along the border;
- Restricted Areas – a part of the airspace where flights of aircraft are prohibited for the purpose of protecting important government buildings and key industrial sites (e.g., nuclear power plants, chemical enterprises, etc.);
- Flight Restriction Zones – parts of the airspace over land or territorial waters that are limited to aircraft flights during specific time periods due to military exercises, rocket launches, research, or controlled explosions;
- Danger Zones – parts of the airspace where, during a specified period of time, activities dangerous to air traffic occur;
- Temporarily Reserved Airspace – airspace where air traffic is not allowed within a specified time because of a threat to regular aviation flights or for other reasons;
- Areas with a Special Airspace Use Regime – a 15.5 mile (25 kilometer)-wide part of the airspace along the Ukrainian state border where a special procedure for flight operations and control is established by the Ukrainian Air Force.

Operators of UAVs are subject to the same liability rules as other air traffic operators. Drone operators may be held criminally liable under the Criminal Code of Ukraine for creating a danger to human life or causing other conditions that threaten the safety of air flights.

Violations of the rules related to the safety of aircraft flights by persons other than air transport workers are punishable by a fine or imprisonment for up to three years if





they expose human lives to danger or cause a risk of any other grave consequences. In cases of injury, death, or other serious consequences, violations of air traffic rules are punishable by imprisonment from five to twelve years. The same punishment is prescribed for violations of rules related to the use of airspace, including the unlawful launch of a drone.

## Canada

In Canada, the regulation of unmanned air vehicles (UAVs) falls under the jurisdiction of the federal government. UAVs are mainly regulated by the Canadian Aviation Regulations (CARs) and standards, guidelines, and circulars issued by Transport Canada. The applicable rules and the necessity for a UAV operator to have a special flight operations certificate (SFOC) depend upon the use of the UAV (recreational vs. nonrecreational), its weight, and whether particular exemptions apply. Drones or model aircraft that weigh 35 kilograms or less and are used for recreational purposes do not require a government-issued SFOC but are subject to safety guidelines. Drones that are used for nonrecreational purposes, or that weigh more than 35 kilograms (irrespective of their purpose), require an SFOC to be flown. Specific directions for operating UAVs are set forth in a General Safety Practices circular issued by Transport Canada and in the SFOC. UAVs that weigh less than 2 kilograms or between 2 kilograms and 25 kilograms are subject to exemptions if the operator is able to follow the strict safety conditions outlined in the two exemptions.

Transport Canada is in the process of issuing new regulations for UAVs that weigh 25 kilograms or less that will eliminate the current distinction between recreational and nonrecreational use. The proposed changes provide a classification system based on the risks involved in the use of UAVS. UAVs weighing 25 kilograms or more will continue to be regulated by the SFOC requirements.

## I. Introduction

### A Constitutional Jurisdiction

Canada's federal government has primary jurisdiction over matters related to aviation and

**KNOW BEFORE YOU GO!**

## FIND YOUR DRONE CATEGORY

**YOU NEED A PILOT CERTIFICATE – BASIC OPERATIONS TO:**

- Fly **+30 m** from bystanders
- Fly in uncontrolled airspace (where no air traffic control is provided)

**YOU NEED A PILOT CERTIFICATE – ADVANCED OPERATIONS TO:**

- Fly less than **30 m** from or over bystanders
- Fly in controlled airspace with air traffic control approval

**YOU NEED A SPECIAL FLIGHT OPERATIONS CERTIFICATE TO FLY:**

- At an advertised event
- A drone over 25 kg
- Above 122 metres (400 feet)

**122 m+** (approximately a 30-storey building)

**25kg+**

Canada.ca/drone-safety



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aeronautics. Section 91 of the Constitution Act, 1867, gives the federal government the general power to make “Laws for the Peace, Order, and good Government of Canada.” In 2010, the Supreme Court of Canada held that aeronautics was in the exclusive jurisdiction of the federal government and “falls within a residuum of national importance, which brings it under Parliament’s power to legislate for the peace, order and good government of Canada.”

Therefore, through the federal government’s primary jurisdiction over aviation and aeronautics, the regulation of unmanned air vehicles (UAVs) also falls within the scope of the federal government’s constitutional power.

The main legislation that regulates aviation is the Aeronautics Act and its subordinate regulations, the Canadian Aviation Regulations (CARs). In addition, UAV operators must “follow the rules in all acts and regulations—including the **Criminal Code**, as well as all municipal, provincial, and territorial laws regarding trespassing and privacy.” Transport Canada, the government department that regulates the use of UAVs, is “responsible for the issuance of transportation (including aviation) operating permits and certifications and for transportation safety oversight.”

The Canadian Aviation Regulation Advisory Council (CARAC) “is a joint undertaking of government and the aviation community” whose main objective is to “to assess and recommend potential regulatory changes through cooperative rulemaking activities.” In 2010 CARAC established the “Unmanned Aircraft System Program Design Working Group to develop new regulations to increase the safety, scope and regulatory efficiency of commercial UAV applications in Canada.”

## B. Drone Industry in Canada

Reflecting the “exponential growth” of the unmanned aircraft industry over the past few years, the 345 special flight operation certificates (SFOCs) for UAVs that Transport Canada issued in 2012 had grown to 1,672 by 2014. According to economic analysis, the expansion of commercial UAV use in Canada in the last 10 years has been dramatic. Due to Canada’s large geography, small population and resource focused economy, there are many potential applications for UAVs for Canadian businesses. The number of UAV operations conducted in 2014 under the SFOC exemptions is not known but can be estimated to be in the thousands. This growth is expected to continue as UAV technology continues to develop.

## II. Regulation Based on Size and Use

Whether a UAV requires an SFOC depends on its use, its weight, and whether particular exemptions apply.

### A. Recreational Use







The Canadian Aviation Regulations defines a “*model aircraft*” as “an aircraft, the total weight of which does not exceed 35 kg (77.2 pounds), that is mechanically driven or launched into flight for recreational purposes and that is not designed to carry persons or other living creatures.” Model aircraft are usually described as devices that are used by hobbyists for recreational purposes. Therefore, if an aircraft weighs **35 kilograms or less** and is used for “**fun of flying only**,” a person does not need permission from Transport Canada for its use. All that is required is to follow the law and fly safely according to safety guidelines.

If an aircraft weighs more than 35 kilograms (irrespective of its use, whether recreational or otherwise) it is legally considered a UAV, and owners must apply for an SFOC.

## B. **Nonrecreational Use**

Canadian Aviation Regulations define an “unmanned air vehicle” as “a power-driven aircraft, other than a model aircraft, that is designed to fly without a human operator on board.” According to section 602.41 of the Regulations, “no person shall operate an unmanned air vehicle in flight except in accordance with a special flight operations certificate or an air operator certificate.”

Therefore, operators of UAVs used for nonrecreational purposes—namely, work or research—are legally required to apply for an SFOC. According to Transport Canada, “[t]his applies to all UAVs used for anything but the fun of flying and regardless of how much they weigh. Transport Canada inspectors will review your SFOC application and determine what safety conditions are needed to reduce the risks.”

However, under what Transport Canada describes as “very specific, lower-risk circumstances,” a person may qualify for exemptions. It is for this reason that Canada is considered to have a permissive regulatory approach to the commercial use of drones.

Persons who wish to fly drones that weigh between 2.1 kilograms and 25 kilograms can do so without permission, as long as they meet certain exemption requirements. This exemption “relieves persons conducting non-recreational UAV system operations utilizing a UAV with a maximum take-off weight not exceeding 2 kilograms, operated within visual line-of-sight [VLOS], from the requirement to obtain a Special Flight Operations Certificate (SFOC).” Another exemption relieves persons “conducting non-recreational UAV system operations utilizing a UAV with a maximum take-off weight exceeding 2 kgs but not exceeding 25 kgs, operated within visual line-of-sight[,] from the requirement to obtain a Special Flight Operations Certificate (SFOC).” Even though permission is not needed for drones weighing between 2.1 kilograms and 25 kilograms, a notification to Transport Canada that includes a description of the operation and geographical boundaries of the operation via a submission form is required.





### C. **SFOC Certificate**

According to Transport Canada, the SFOC “contains conditions specific to the proposed use, such as maximum altitudes, minimum distances from people and property, operating areas, and coordination requirements with air traffic services.” There are a “number of SFOC application processes depending on the nature and use of the UAV,” and “the more complex and risky the proposed operation, the more thorough and onerous the application process.” Essentially the most important aspect of the SFOC application is the operator’s proof to Transport Canada that he/she will be operating the drone safely and not disrupting air traffic.

The application for an SFOC for the purpose of operating a UAV requires the following information:

- a) the name, address, and where applicable, the telephone number and facsimile number of the applicant;
- b) the name, address, and where applicable the telephone number and facsimile number of the person designated by the applicant to have operational control over the operation (Operation Manager);
- c) method by which the Operation Manager may be contacted directly during operation;
- d) the type and purpose of the operation;
- e) the dates, alternate dates and times of the proposed operation;
- f) a complete description, including all pertinent flight data on the aircraft to be flown the security plan for the area(s) of operation and security plan for the area(s) to be overflown to ensure no hazard is created to persons or property on the surface;
- g) the emergency contingency plan to deal with any disaster resulting from the operation;
- h) the name, address, telephone and facsimile numbers of the person designated to be responsible for supervision of the operation area (Ground Supervisor), if different from the Operation Manager during the operation;
- i) a detailed plan describing how the operation shall be carried out. The plan shall include a clear, legible presentation of the area to be used during the operation. The presentation may be in the form of a scale diagram, aerial photograph or large scale topographical chart and must include at least the following information:
  - i. the altitudes and routes to be used on the approach and departure to and from the area where the operation will be carried out;
  - ii. the location and height above ground of all obstacles in the approach and departure path to the areas where the operation will be carried out;
  - iii. the exact boundaries of the area where the actual operation will be carried out;





- iv. the altitudes and routes to be used while carrying out the operation;
- j) any other information pertinent to the safe conduct of the operation requested by the Minister.

An application for an SFOC for the purpose of flying a UAV has to be “received by the appropriate Regional Transport Canada General Aviation Office, at least 20 working days prior to the date of the proposed operation or by a date mutually agreed upon between the applicant and Transport Canada.”

### III. Restrictions on Drone Use

#### A. Restrictions on Recreational Use

Recreational drone operators must follow Transport Canada’s safety guidelines and the rules found in the advisory circular on General Safety Practices – Model Aircraft and Unmanned Air Vehicle Systems.

The safety guidelines advise that the following rules be kept in mind before a flight:

- a. inspect that your model aircraft is ready for flight. *This means that the aircraft, control station components (hardware, software and firmware) and control links are in a fit for flight condition;*
- b. seek permission from the property owner on which you intend to operate your model aircraft;
- c. know the classification of the airspace you want to fly in. It would be inappropriate and unsafe for you to operate in airspace with heavy aircraft traffic, such as around airports;
- d. confirm that there is no radio frequency interference (from a nearby radar site for example) that will interfere with the control of your aircraft;
- e. have an emergency plan just in case. *This means know the people and equipment available that could help you respond to an incident, accident, medical emergency, you have a fly-away or if your model aircraft becomes uncontrollable.*

These rules also recommend that operators fly their drones during daylight hours and in good weather. During a flight drones should be kept in sight, “where you can see it with your own eyes—not only through an on-board camera, monitor or smartphone.” Drone operators should respect the privacy of others and should not operate the drone “with any dangerous goods or lasers on the aircraft.”

The guidelines also state that drones should be flown at least 9 kilometers away from airports, heliports, or airfields. They should be no higher than 90 meters above the ground and at least 150 meters away from people, animals, buildings, structures, or vehicles. They should not be flown near moving vehicles, highways, bridges, busy streets, or anywhere they could endanger or distract drivers. They should also not be flown “within restricted and controlled







airspace, including near or over military bases, prisons, and forest fires.” Drones should not be flown anywhere where they may interfere with first responders. Recreational drones are also prohibited from use in national parks.

## **B. UAV Operators Who Have Been Issued an SFOC**

Where a drone is operated under an SFOC, “in addition to any specific directions respecting operations set out in the SFOC and the underlying application,” the advisory circular on General Safety Practices - Model Aircraft and Unmanned Air Vehicle Systems apply.

## **C. UAV Operators Under an SFOC Exemption**

If the UAV is operated under an SFOC exemption, the governing guidelines are set out in the Guidance Material for Operating Unmanned Air Vehicle Systems Under an Exemption. This advisory circular sets out all the conditions that must be complied with “in order to use the exemption as your authority to operate a UAV.” The circular contains detailed general conditions, flight conditions, and pilot training conditions.

UAV operating guidelines set out in the advisory circular include some of the following rules:

1. a human operator is required at all times;
2. operators must be at least 18 years of age;
3. operators cannot be impaired by drugs or alcohol;
4. autonomous (i.e., computer or GPS controlled or guided) operation is not permitted. UAVs must be directly controlled by a human operator at all times;
5. beyond-line-of-sight operation is not permitted. Live and direct sight of the UAV by the operator is required at all times;
6. operation and control of UAVs through on-board camera, monitor or smartphone is not permitted;
7. UAVs may only be flown during daylight and in good weather (not in clouds or fog);
8. UAVs must be in safe and working condition before operating. However, the CARs relating to aircraft certification and airworthiness do not apply to UAVs;
9. UAVs cannot be used to transport dangerous goods.

A pilot can operate a UAV only at or below 300 feet above ground level (AGL). Moreover, a pilot operating under this exemption must not operate a UAV over a forest fire area, or over any area that is located within 5 nautical miles (nm) of a forest fire area. According to the circular, a UAV is prohibited in airspace that has been restricted by the Minister or the Aeronautics Act. A UAV must be flown at least 5 nm away from a built-up area or from the center of any airfield. A drone can be flown only at a lateral distance of at least 500 feet from the general public, buildings, structures, vehicles, vessels, animals, or persons





unless certain exceptions apply. (For a UAV not exceeding 2 kilograms, the lateral distance for UAVs is reduced to 100 feet.). A person cannot operate a UAV over an open-air assembly of persons.

Each exemption also contains specific training requirements. For example, according to Transport Canada, to fly a UAV that weighs between 2 kg and 25 kg without permission, the UAV pilot must be trained to understand:

- airspace classification and structure
- weather and notice to airmen (NOTAM) reporting services
- aeronautical charts and the Canada Flight Supplement
- relevant sections of the Canadian Aviation Regulations.

As stated in Part II(B), above, drones that weigh between 2 kilograms and 25 kilograms used for nonrecreational purposes are also subject to reporting requirements, including notifying the Minister of the type of work being conducted and specific incidents of injury to any person requiring medical attention or other collisions.

## D. Other Applicable Laws

The Criminal Code of Canada contains several offenses “involving the dangerous operation of aircraft and endangering the safety of other aircraft.” Punishments for these offenses consist of “monetary penalties and/or jail time including imprisonment for life”. According to Transport Canada, “[v]iolations of the model aircraft regulation are handled by the courts or judicial action. Endangering the safety of aircraft is a serious offence under the Aeronautics Act and is punishable by a fine”.

The private use of jamming equipment to disrupt drones also appears to be illegal in Canada.

Transport Canada has stated that it is working with the Office of the Privacy Commissioner to ensure that drone operators respect Canada’s privacy laws. Privacy concerns have been raised by provincial-level privacy commissioners. A 2013 report from the Privacy Commissioner of Canada stated that the current regulations did little to address privacy concerns and that, as drones are acquired and put to use in Canada’s public and private sectors, it will be important to circumscribe their use within an accountability structure that ensures they are justified, necessary and proportional, and that the necessary checks and balances fundamental to a democratic society are in place to stave off proliferation of uses, abuses, and function creep. Canada’s privacy laws will, and do apply to UAVs deployed by public or private sector organizations to collect and/or use personal information about citizens.

## IV. Enforcement and Noncompliance

According to Transport Canada, if an incident is reported to the police department, an inspector will verify that the operator followed the rules and used the drone safely.





Local police may also verify if other laws were broken, including the **Criminal Code** and privacy laws. If you fly a drone for recreational purposes (for the fun of flying), it's illegal to do anything that puts aviation safety at risk.

News reports indicate that enforcement of some of these laws may be lacking.

The use of a UAV without an SFOC may result in a fine of Can\$5,000 (approximately US\$3,850) for individuals and \$25,000 (approximately US\$19,240) for corporations. Transport Canada requires SFOCs so that it can verify operators can use their UAV reliably and safely. If an operator does not follow the requirements and conditions of the SFOC, Transport Canada can issue fines of up to Can\$3,000 (approximately US\$2,310) for an individual and Can\$15,000 (approximately US\$11,545) for a company. A person who is under an exemption yet operates a UAV in a reckless or negligent manner (e.g., not complying with the conditions in the exemptions) can be subject to a fine of Can\$5,000 for individuals or Can\$25,000 for corporations.

Since 2010, Transport Canada says it has investigated some fifty incidents involving unmanned aircraft across the country.

## V. Proposed Changes

As noted in Part I(A), above, in 2010, Transport Canada established a joint industry and federal government working group to develop recommendations for regulatory changes. This led to proposed changes, which were made public on May 2015 in the Notice of Proposed Amendment on Unmanned Air Vehicles and on which Transport Canada invited comments from aviation stakeholders across Canada.

According to lawyers, the proposed changes would “replace the current ‘exemption’ scheme, which was intended to be a temporary solution while Transport Canada introduced more rigorous safety requirements and created greater awareness of UAV operators’ legal obligations.” The changes would apply to any UAV with a total weight at takeoff of 25 kilograms or less and which is operated in VLOS. They would also eliminate the current distinction between recreational and nonrecreational use. UAVs weighing 25 kilograms or more would continue to be regulated by the SFOC requirements.

The proposed changes provide a new classification system based on the risks involved in the use of UAVs. There are two categories for UAVs weighing 25 kilograms or less, which are described as (a) “Small UAVs used in complex operations,” and (b) “Small UAVs used in limited operations.” UAVs in the first category would be used in and around urban or built-up areas and would allow operations near to airfields and would have “the most comprehensive set of regulatory requirements which, in turn, would provide for the greatest level of safety and operational flexibility. The second category would apply to UAV use limited to remote areas and would have fewer regulatory requirements.







A third category is being considered for very small UAVs, which could be based “on weight or [on] . . . an alternative approach, such as kinetic energy.” Other considerations in the proposed regulations include the following:

Other than the ability of UAVs in the “complex operations” category to operate in closer proximity to built-up areas and aerodromes [airfields], a primary difference between the requirements for the “complex operations” and “limited operations” categories is pilot training. For all operations, Transport Canada has proposed that UAV pilots be considered a “pilot” as defined by the **Aeronautics Act** and the CARs. However, operators in “complex operations” would be required to obtain a “pilot permit.” Suggested requirements for a pilot permit include a minimum age of 14 (with adult supervision) or 16 (without adult supervision), a category 4 medical certificate, successful completion of a course of instruction in specific aviation knowledge areas and a written examination, practical training on the specific category of UAV, and demonstrated competency in the performance of normal and emergency procedures.

In contrast, a pilot operating a UAV in either the “limited operations” or “very small UAVs” category would not be required to obtain a pilot permit or medical certificate, and there would be no minimum age requirement provided there is adult supervision. However, the operator would be required to demonstrate aeronautical knowledge in specific subject areas, such as airspace classification and structure.

The other principal difference between the three proposed categories is with respect to marking, registration, and identification. Transport Canada has proposed that UAVs in both the “limited” and “complex” operations categories be required to be marked and registered. They would be required to have a unique series of four-letter registration marks, and to be registered in accordance with the requirements for aircraft registration in the CARs. These include that the registrant be at least 16 years of age and a Canadian citizen or permanent resident, and, if the operator is a corporation, it must meet certain requirements of Canadian ownership and/or incorporation.

Operators of very small UAVs would not be required to register their aircraft, but would be required to have a permanent marking for identification, including the name of the pilot and his or her contact information, on the UAV.

## China

The December 2015 Interim Provisions on Light and Small Unmanned Aircraft Operations (UAS Operation Provisions) issued by China’s civil flight regulatory agency, the Civil Aviation Administration of China, regulate the operation of unmanned aircraft systems (UAS) with a maximum empty weight of 116 kilograms or less, or a maximum take-off gross weight of 150 kilograms or less, and a



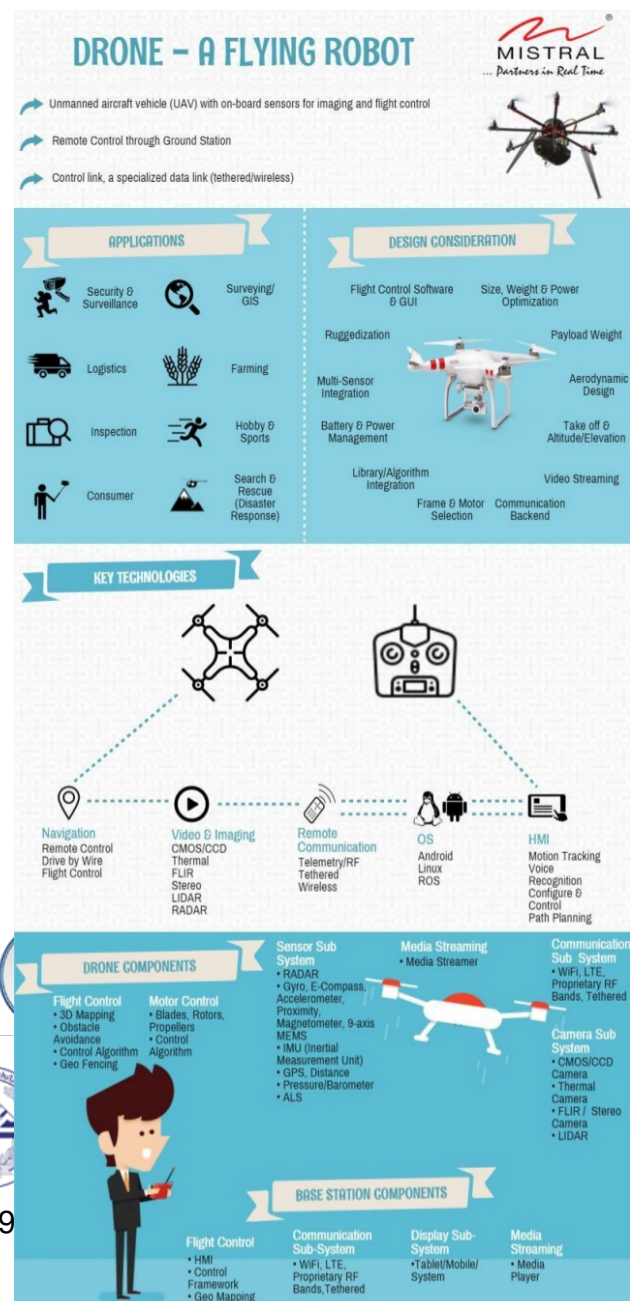


calibrated air speed of no greater than 100 kilometers per hour. UAS weighing 1.5 kilograms or less are generally not required to follow the Provisions. The UAS Operation Provisions set forth an online, real-time supervision system comprising the “electric fence,” a system consisting of hardware and software that stops aircraft from entering certain areas, and the “UAS Cloud,” a dynamic database management system that monitors flight data, which has an alarm function for UAS connected to it that is activated when these UAS fly into the electric fence. Airport obstacle control surfaces, as well “prohibited areas, restricted areas, and danger zones” provided by other laws and regulations, are restricted areas prescribed by the UAS Operation Provisions. UAS connected to the UAS Cloud must follow the restrictions shown in the system, while those not connected to the UAS Cloud must consult with relevant authorities about the restricted areas. UAS flying within visual line of sight (VLOS) must be operated in the daytime. Such a requirement does not apply to UAS flying beyond visual line of sight (BVLOS), but a certain regulatory framework for addressing emergencies applies to BVLOS flights. Both UAS flying within VLOS and BVLOS must give way to *manned aircraft*.

## I. Introduction

The People's Republic of China (PRC or China) has not passed any legislation specifically regulating drones or unmanned aircraft systems (UAS). Civil aviation and flight activities are primarily regulated by the PRC Civil Aviation Law, the PRC General Flight Rules, and the Regulations on General Aviation Flight Control. They have not, however, expressly extended their application to the flight of UAS. China's civil flight regulatory agency, the Civil Aviation Administration of China (CAAC), has issued advisory circulars setting up guidelines for the flight of UAS. These interim measures are expected to be updated as the UAS industry and regulatory framework develop.

The CAAC is considering new rules on commercial operations of UAS and issued a draft of the rules to solicit public opinion in December 2015, but a





final version of the rules has not yet been adopted. 2 In addition, the Ministry of Industry and Information Technology (MIIT) is reportedly planning new UAS regulations.<sup>3</sup>

## II. Legislation on Civil Aviation and Flight Activities

### A. PRC Civil Aviation Law

The PRC Civil Aviation Law regulates civil aviation throughout the country. The Law authorizes the CAAC to formulate regulations concerning civil aviation. The term “civil aircraft” under this Law refers to any aircraft other than those used for military, customs, and police purposes.

### B. PRC Basic Rules of Flight

According to the PRC Basic Rules of Flight that were originally promulgated in 2000 and last amended in 2007, all flight activities in China are under unified state control, which is delegated to the State Council and the Central Military Commission (CMC). According to the Rules, all individuals and organizations in China owning aircraft and their flight activities are subject to the Rules.

### C. Regulation on Flight Control of General Aviation

The Regulation on Flight Control of General Aviation is an administrative regulation that applies to all commercial and recreational operations of aircraft except those involved in public air transportation. “General aviation” under Chinese law refers to *“aviation operations other than military flights, police aerial actions, customs anticontraband flights, and public air transportation flights. It includes flight operations in the fields of industry, agriculture, forestry, fishery, mining, and construction, and flight operations in the fields of medical and health work, emergency rescue and disaster relief, meteorological observation, ocean monitoring, scientific experiments, remote sensing and mapping, education and training, culture and sports, and tourism and sightseeing, etc.”*

## III. UAS Operation Provisions

On December 29, 2015, the CAAC issued the Interim Provisions on Light and Small Unmanned Aircraft Operations (UAS Operation Provisions). The Provisions regulate UAS with a maximum empty weight of 116 kilograms or less, or a maximum take-off gross weight of 150 kilograms or less, and a calibrated air speed of no greater than 100 kilometers per hour. The Provisions are also applicable to “plant protection UAS” used for agricultural, landscaping, or forest protection purposes with a maximum take-off gross weight of 5,700 kilograms or less and flying no higher than 15 meters above the surface, and unmanned airships with an inflatable volume of 4,600 cubic meters or less.

### A. UAS Categories

The UAS Operation Provisions divide UAS and unmanned airships subject to its regulation into seven categories, mainly based on weight and use, as follows:







- **Category I:** UAS weighing 1.5 kilograms or less;
- **Category II:** UAS with an empty weight between 1.5 kilograms and 4 kilograms or with a take-off gross weight between 1.5 kilograms and 7 kilograms;
- **Category III:** UAS with an empty weight between 4 kilograms and 15 kilograms or with a take-off gross weight between 7 kilograms and 25 kilograms;
- **Category IV:** UAS with an empty weight between 15 kilograms and 116 kilograms or with a takeoff gross weight between 25 kilograms and 150 kilograms;
- **Category V:** Plant protection UAS;
- **Category VI:** Unmanned airships;
- **Category VII:** Category I and II UAS that can operate 100 meters beyond visual line of sight.

Category I UAS are required to be operated safely and to avoid causing injury to others, but are not otherwise subject to the UAS Operation Provisions. Nor do the Provisions apply to model aircraft and indoor flights, except under certain conditions specified by the Provisions.

## B. Electric Fence and UAS Cloud

The UAS Operation Provisions set forth an online, real-time supervision system that has two components: the “electric fence” and the “UAS Cloud.” The “electric fence” is a system consisting of hardware and software that stops aircraft from entering certain areas. The UAS Cloud is a dynamic database management system that monitors flight data, including operation information, location, altitude, and speed, in real time. The UAS Cloud has an alarm function for UAS connected to it that is activated when these UAS fly into the electronic fence.

UAS under categories III, IV, VI, and VII must install and use the electric fence and connect to the UAS Cloud. Operators must report at least every second when in densely populated areas and at least every thirty seconds when in non-densely populated areas.

UAS under categories II and V are required to install and use the electric fence, connect to the UAS Cloud, and report at least every second if they are operated above the airspace of key areas and in airport clear zones. “Key areas” is defined by the Provisions to include military sites, nuclear plants, administrative centers and their neighboring areas, and areas temporarily designated as key areas by local governments.

A qualified UAS Cloud provider must be approved by the CAAC for a trial operation, among other requirements specified by the UAS Operation Provisions. A UAS Cloud system developed by the Aircraft Owners and Pilots





Association of China, “U-Cloud,” has been approved for operation during a two-year period from March 4, 2016, to March 3, 2018.

### C. **Restricted Areas**

Airport obstacle control surfaces are restricted areas prescribed by the UAS Operation Provisions. “Prohibited areas, restricted areas, and danger zones” provided by other laws and regulations are also restricted areas under the Provisions. UAS connected to the UAS Cloud must follow the restrictions shown in the system, while those not connected to the UAS Cloud must consult with relevant authorities about the restricted areas.

In 2009, the CAAC issued rules on air traffic control for civil UAS, which subject civil UAS to the relevant provisions of the Civil Aviation Law, the Basic Rules of Flight, the Regulation on Flight Control of General Aviation, and other rules concerning air traffic control issued by the CAAC.

### D. **Flight Specifications**

According to the UAS Operation Provisions, UAS flying within visual line of sight (VLOS) must be operated in the daytime. Such a requirement does not apply to UAS flying beyond visual line of sight (BVLOS), but a certain regulatory framework for addressing emergencies applies to BVLOS flights. Both UAS flying within VLOS and BVLOS must give way to manned aircraft.

### E. **Insurance**

In compliance with the PRC Civil Aviation Law, the UAS Operation Provisions require UAS operators to buy insurance for UAS covering liability for third parties on the ground, a requirement deemed to be “consistent with best practices.”

### F. **Pilots**

The UAS Operation Provisions require a pilot-in-command to be appointed who is directly in charge of the operation of the UAS and has the right to make final decisions. Qualification requirements for UAS pilots are prescribed by another CAAC advisory circular issued in 2013, the Interim Provisions on the Administration of Civil Unmanned Aircraft System Pilots.

## IV. **Manufacturing and Sale**

### A. **Allocation of Frequencies**

On March 10, 2015, the MIIT issued a notification setting forth the radio frequency spectrum allocation for UAS. According to the notification, 840.5–845MHz, 1430–1444MHz, and 2408–2440MHz are dedicated to UAS.

### B. **Export Ban**

In mid-2015, a temporary export ban on certain dual-use UAS was announced by the State Administration of Science, Technology and Industry for National





Defense (SASTIND) under the MIIT, joined by the Ministry of Commerce (MOFCOM), General Administration of Customs (Customs), and the army.

As of the date of this report, the temporary export ban does not appear to have been lifted

## V. Privacy, data protection

The December 2015 Interim Provisions on Light and Small Unmanned Aircraft Operations (UAS Operation Provisions) issued by China's civil flight regulatory agency, the Civil Aviation Administration of China, regulate the operation of unmanned aircraft systems (UAS) with a maximum empty weight of 116 kilograms or less, or a maximum take-off gross weight of 150 kilograms or less, and a calibrated air speed of no greater than 100 kilometres per hour. UAS weighing 1.5 kilograms or less are generally not required to follow the Provisions.

The UAS Operation Provisions set forth an online, real-time supervision system comprising the "electric fence," a system consisting of hardware and software that stops aircraft from entering certain areas, and the "UAS Cloud," a dynamic database management system that monitors flight data, which has an alarm function for UAS connected to it that is activated when these UAS fly into the electric fence.

Airport obstacle control surfaces, as well "prohibited areas, restricted areas, and danger zones" provided by other laws and regulations, are restricted areas prescribed by the UAS Operation Provisions. UAS connected to the UAS Cloud must follow the restrictions shown in the system, while those not connected to the UAS Cloud must consult with relevant authorities about the restricted areas.

UAS flying within visual line of sight (VLOS) must be operated in the daytime. Such a requirement does not apply to UAS flying beyond visual line of sight (BVLOS), but a certain regulatory framework for addressing emergencies applies to BVLOS flights. Both UAS flying within VLOS and BVLOS must give way to manned aircraft.

## VI. Authorities involved in Regulation and oversight of drones operations

### A. Civil Aviation Administration of China (CAAC)

The **Civil Aviation Administration of China (CAAC)** is the aviation authority under the Ministry of Transport of the People's Republic of China. It oversees civil aviation and investigates aviation accidents and incidents. As the aviation authority responsible for China, it concludes civil aviation agreements with other aviation authorities, including those of the Special administrative regions of China which are categorized as "special domestic".

The CAAC does not share the responsibility of managing China's airspace with the Central Military Commission under the regulations in the Civil Aviation Law of the People's Republic of China.







CAAC was formed on November 2, 1949, shortly after the founding of the People's Republic of China, to manage all non-military aviation in the country, as well as provide general and commercial flight service (similar to Aeroflot the Soviet Union). It was initially managed by the People's Liberation Army Air Force.

In 1980 the airline was transferred to the direct control of the State Council. In 1987 the airline division of CAAC was divided up into a number of airlines, each named after the region of China where it had its hub. Since then, CAAC acts solely as a government agency and no longer provides commercial flight service.

In March 2008, CAAC was made a subsidiary of the newly created Ministry of Transport, and its official Chinese name was slightly adjusted to reflect it being no longer a ministry-level agency. Its official English name has remained Civil Aviation Administration of China. The main functions of the Civil Aviation Administration of China:

To put forward development strategies and long-term plans for the civil aviation industry; provide specific suggestions related to the comprehensive system of transport; formulate rules and regulations; implement and supervise; draft policies, standards, laws and regulations; and promote the institutional reform of the civil aviation industry;

To shoulder the regulatory responsibility of flight safety and ground safety; examine, supervise and monitor the work of representatives of civil aircraft manufacturers, training institutions, and maintenance companies; supervise the transportation of hazardous articles; take charge of the nationality registration and operational assessment of civil aircraft; regulate and examine the minimum standards for operation; appraise staff of civil aviation companies; regulate and supervise hygiene and sanitation in the civil aviation industry;

To regulate the air traffic control system of civil aviation; divide and authorize airspace; construct and regulate airways; supervise and manage communication and navigation, aeronautical information and meteorological data collected for civil aviation;

To supervise flight safety; deal with skyjacking, bombing and other crimes that affect regular operation; take charge of safety inspections, airport security, and fire emergency procedures;

To summarize conditions that jeopardize or may jeopardize the safety of civil aviation; investigate and deal with civil aviation accidents according to the law; organize and coordinate emergency response; organize and coordinate important transportation tasks; and participate in national defense mobilization.





## VII. Enforcement measures

China's drone laws have attempted to strike a middle ground between supporting the booming commercial and consumer drone industry and ensuring the public's safety.

For those light and small consumer drones, the rules are relatively loose. But for those big and heavy business-purpose drones, the rules are more restricted, as they could cause more danger to people.

At the end of the 2019, CAAC update the national drone legislation, thus harmonizing the provisions of the national legal framework with international trends in the field, particularly those in Europe and North America. The main aspect taking in consideration in the updated was:

- **Maximum Altitude:** 120m (~400ft); anything higher requires a commercial license from the CAAC. Most drones, including those from the popular DJI brand, automatically set the 120m max altitude and will warn you if you try to manually adjust the max altitude settings;
- **Maximum Distance:** Like many countries, China requires a VLOS or "Visual Line of Sight" with your drone. In other words, you technically need to fly with your drone in sight. In reality, now that the size of drones keeps getting smaller and the max distance keeps getting longer, VLOS is hard to achieve even on the clearest of days. Still, you are expected to know where your drone is at all times;
- **Maximum Weight:** For drones that weigh more than 250 grams (~.55lbs), China requires real-name drone registration (more on that below). Any drone weighing more than 7kg (~15lbs) requires a special license from the CAAC;
- **No-Fly Zones:** All drones are subject to China's NFZs or "No Fly Zones". These zones include the area around airports, military installations and specified cities such as Beijing and in sensitive areas like Xinjiang or Tibet. DJI drones are programmed not to take off in these NFZs (although there are hacks to bypass this) but for many other drone brands you will need to check the "No Fly Zone map" in China to determine if drone flight is permitted near your destination. It is possible to obtain permission to fly in an NFZ through the CAAC.
- **Commercial Flights:** All drones flown for commercial purposes are supposed to have a license through the CAAC. More on that below.
- **Insurance:** According to China drone regulations, drone operators are obligated to cover their liability for third parties on the ground through insurance.

## United States of America

Multiple parts of the Federal Aviation Regulations ("FARs") could apply to your drone flight





but the 4 common areas of regulations are Part 47, Part 48, Part 101, and Part 107.

## 1. Part 47 – Paper Registration

Part 47 is the set of regulations that manned and unmanned aircraft register their aircraft under. This is the paper based method of registration which is annoying and takes a while to complete. The FAA created Part 48 for unmanned aircraft because:

- a. Part 47 would be costly to the FAA to run;
- b. would back up the entire registration system;
- c. and Part 47 has a finite amount of N numbers which means the drones would completely exhaust the supply for registration numbers.

Unmanned aircraft that are 55 pounds or more, intend to be operated outside of the territorial airspace of the United States, or registered through a trust or voting trust must register through Part 47. Everyone else has the option of register under Part 47 or Part 48.

Part 47 is per **aircraft** while Part 48 for model aircraft flyers is per **person** which means that a model aircraft flyer can save money going with Part 48.

## 2. Part 48 – Online Registration

This registration is only for drones weighing less than 55 pounds and more than 0.55 pounds (250 grams) on takeoff, including everything that is on board or otherwise attached to the aircraft and operated outdoors in the national airspace system. Unmanned aircraft that are 55 pounds or more, intend to be operated outside of the territorial airspace of the United States, or registered through a trust or voting trust must register through Part 47.

Part 48 is the online method of registering your drone. The aircraft owner fills out the information on the websites and receives a Certificate of Aircraft registration will be delivered to the aircraft owner via the same web-based platform used to register the aircraft. The Certificate of Aircraft registration contains the drone owner's name, issue date, and registration number. A Certificate of Aircraft Registration issued in accordance with part 48 is effective once the registration process is complete and must be renewed every three years. If you are flying your aircraft exclusively as recreational, you can create a registration identification for \$5 which you can put on all of your aircraft. If you are flying your aircraft as non-recreational, such as commercial or government, you would register each aircraft for \$5. Persons 13 years of age and older are permitted to use the part 48 process to register a small unmanned aircraft. If the owner is less than 13 years of age, then the small unmanned aircraft must be registered by a person who is at least 13 years of age.

Owners of small unmanned aircraft must register their aircraft prior to operation of the sUAS. Part 48 as applied to model aircraft flyers was briefly declared illegal with the Taylor v. FAA case but the National Defense Authorization Act of 2017 undid the







Taylor v. FAA case ruling which means that unless there is another court ruling over turning the NDAA of 2017, you should follow the law.

### 3. Part 91

This is a set of operating regulations for aircraft both manned and unmanned. You have different ways to get airborne legally with a drone. You have the options of operating under Part 91 or under Part 107. Part 107 is far easier to comply with for most operations but there are times when you need to operate under Part 91. Prior to Part 107, the only thing available was Part 91, and other parts of the FARs, for drone operations. During this time, we operated under Section 333 (now called Section 44807) exemptions and the rest of the regulations.

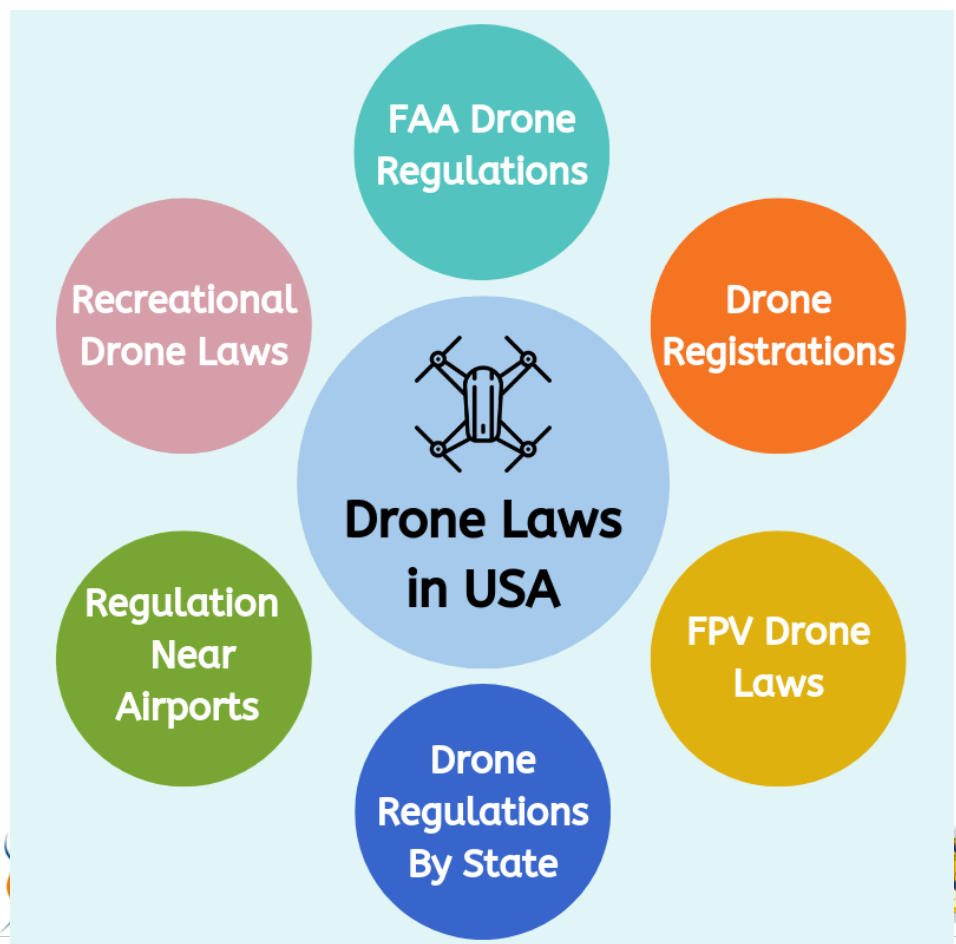
Since we have Part 107, why would anyone fly under this part? Operations of unmanned aircraft weighing 55+ pounds, public aircraft operations, and unmanned aircraft air carrier operations. It might surprise you but public aircraft operations under public COAs and some Section 44807's still use this method.

Most individuals flying under Part 107 come in contact with regulations from this part because Part 107 references the alcohol and drug prohibitions and flight restriction regulations listed in Part 91.

### 4. Part 93 – Special Air Traffic Rules for Certain Locations

This part prescribes special air traffic rules for operating drones in certain areas described in this part, unless otherwise authorized by air traffic control.

The FAA made a huge amount of noise over the Washington D.C. Special Flight Rules Area Sections (93.251 – 93.253) back in 2015 and 2016. This area is heavily restricted some of it is a complete no drone zone.





## 5. Part 101 - What Model Aircraft Flyers Operate Under

FAA Reauthorization Act of 2018 substantially changed things with how recreational drones are flown. Do NOT rely on Part 101.

## 6. Part 107 – Remote Pilot Certification, Operating Rules, Aircraft Requirements, etc.

Recreational, commercial, and government pilots can all fly under this Part 107 which is far easier to comply with than Part 91. Part 107 tells how to obtain remote pilot certificate, how to lose it by violating the operating rules, and how to get waivers from certain types of operating restrictions.

## 7. Part 137 – Spraying from a Drone (Mosquito Abatement, Crop Dusting, Fertilizer, etc.)

If you are flying your drone “for the purpose of dispensing any economic poison,

- a. dispensing any other substance intended for plant nourishment, soil treatment, propagation of plant life, or pest control;
- b. engaging in dispensing activities directly affecting agriculture, horticulture, or forest preservation, but not including the dispensing of live insects”

then your operations will be falling under Part 137.

This part applies to recreational and commercial drone operators. Sections of Part 137 cannot be complied with easily so if you want to do some drone spraying operations, you’ll need an exemption from certain sections of the regulations.

Bearing in mind all the above mentioned legislative aspects, the legal conditions for the use of drones in the US are the following:

### 1. Drone Regulations in the US

- **Maximum Height allowed:** The maximum height from where you can fly the drone is not defined for home users in the USA. There used to be a limit of 400 feet. So, It is sagacious to keep your drone at this limit. For commercial users, other rules apply.
- **Maximum take-off weight (MTOW):** MTOW is simply the maximum weight that a drone can carry under its own power, take off and achieve it’s designed specifications like range or endurance.
- Most FPV systems work on the 5.8 GHz while FPV is possible with a spotter by holding visual contact.
- **Drone insurance:** If you want to take your drone in the sky, you will need to have drone insurance in many countries. But, in the case of the USA, there is currently no compulsory insurance regulations in this regard.
- Conversely, you have the right to protect your flights accordingly. In general, two types of drone insurance are offered **drone hull insurance** and **drone liability insurance**.





- The **drone liability insurance** is also known as aviation liability insurance. This insurance will cover all the costs, in case, you cause damage to another person due to an operator error or a technical defect.
- **Distance to airports:** At airports, a distance of 5 miles (8,047 meters) is required.
- **Other safety distances:** Further safety distances in the USA do not exist as per available information.
- **Flight bans:** In USA, Drone flight bans apply in all national parks. Also, you cannot fly in New York City. Washington.
- **Operating Times:** Drones may only be used during the day and at twilight.
- Specifically, this is the time from 30 minutes before sunrise and 30 minutes after sunset.
- **Rules for Commercial Pilots:** If you want to upgrade a copter for commercial use in the United States, you will need to take a test and qualify for a Remote Pilot Certificate.
- **Special regulations:** At present, the rules in the individual states or even cities may differ from the laws at the federal level. You should beware the local rules during a USA trip.
- For example, the use of drones is completely prohibited in New York City. Exceptions are only possible for TV stations. 160 kmh is the maximum allowed speed of the drone.

## 2. Recreational Drone Laws

Before flying a drone, you need to register it with the FAA on the FAADroneZone website. All drone owners are directed by the FAA to register their drones having weighs between 0.55 and 55 pounds. Registration costs only \$5 and is valid for three years.

- You need to maintain sufficient distance from populated areas and respect others' privacy. It is prohibited by the FAA to fly over public events, groups of people or the recreational stadiums during people gathering.
- You cannot fly on the territory of military or power installations, airports, vulnerable property, national parks, or within Washington DC.
- You can fly your drone no higher than 400 feet from the earth.
- You must fly within maximum visual capacity.
- You drone weight should be less than 55 pounds.
- You cannot fly near emergency situations such as fires or hurricane recovery efforts.
- You cannot fly under the influence of drugs or alcohol.

## 3. FAA Drone Regulations

- United States FAA Report for 2020 reported that a number of unmanned drones are expected to double in the till next year from roughly 1.2 million aircraft to nearly 2.4 million aircraft.







- On the other hand, commercial drone activity continues to grow. A new wave has been seen that recreational-use drones benefit from the same price and performance curve as commercial drones. Many recreational drones are now being used for commercial filming and real-estate use.
- The FAA treats both commercial and recreational flying contrarily. Drone less than 55 pounds for commercial use must qualify for a Part 107 license and get an FAA Remote Pilot Certificate.
- Drones are much easier to fly and can be virtually launched from any location, they are proliferating — and causing accidents. FAA modifying their rules regularly to find the right balance for safety and recreational drone use.

### 3.1 Drone Laws 2020 update

- Last week FAA induced the major changes in recreational drone flying rules to date. Currently, recreational drone flying was governed under Section 336 of Public Law 112-95 that is previously known as the FAA Modernization and Reform Act of 2012. Section 336 controlled special rules for model aircraft.
- Under FAA rules, small drones fewer than 55 pounds were classified as model aircraft and could not be required to register with the FAA. However, it became Public Law 114-328, when President Trump signed the National Defense Authorization of 2017.
- As confusing as all that is, you can ignore it. That's because, when President Trump signed H.R. 302, the FAA Reauthorization Act of 2018 last October, it became Public Law 115-254. That law went into effect on May 20, 2020, and marks quite a few changes in how recreational drones are managed.
- Another new law is added known as "limited recreation operations that some interesting new restrictions and operations to recreational drone flying.

### 3.2 DRONE REGULATIONS BY STATE

As per federal drone regulations, states also have passed laws regulating the use of drones by individuals, businesses, law enforcement, and other interests. Below are summaries of drone laws by state.

#### Following state has no rules regarding the drones:

*Alabama, Alaska, Arizona, Colorado, Connecticut, District of Columbia, Delaware, Georgia, Massachusetts, Missouri, Montana, Nebraska, Indiana, Iowa, Kansas, Kentucky, New Jersey, New Mexico, New York, Oklahoma, Ohio, Pennsylvania, Rhode Island, South Carolina and South Dakota.*

**Remaining states have own regulations for drone flying. Some major states rules and regulations are as under:**

- **Arkansas**





As per Act 293, the use of drones to commit video voyeurism is prohibited. Class B misdemeanor; Class A misdemeanor if images were distributed or transmitted to another party, or posted to the Internet.

Act 1019: Prohibits the use of drones for surveillance and/or the gathering of information on “critical infrastructure” (oil refinery, chemical manufacturing facility, power plant, etc.) without written consent.

- **California**

As per Civil Code Section 1708.8, it is prohibited the use of drones to capture video or a sound recording of another person without their consent (invasion of privacy). Violators are liable for up to three times the amount of damages related to the violation, and a civil fine of between \$5,000 and \$50,000.

- **Florida**

As per Criminal Code Section 934.50 of Florida, Drones may not be used for surveillance in order to maintain privacy; this includes law enforcement. However, the police may use drones with a valid search warrant. Violators may be ordered to pay legal fees and compensatory damages; victims may seek injunctive relief.

- **Hawaii**

Act 208 of Hawaii, it is required to establish a drone test site advisory board and creates the position of a chief operating officer to oversee the test site.

- **Michigan**

As per Laws Section 324.40112: it is Prohibited the use of drones to harass or interfere with a hunter (charged as a misdemeanor; up to 93 days incarceration and/or up-to \$1,000 fine per offense).

As per Laws Section 324.40111c: it is Prohibited the use of drones to take game or fish (i.e., locating, hunting, catching, or trapping animals).

- **North Carolina**

Section 7.16(e) of S.L. 2013-360: Gives the state’s Chief Information Officer authority to approve (or disapprove) the operation of drones by state agencies, requires a test for the operation of drones.

## 4. FAA Regulations for Drone Near Airports

**FAA induced two new rules that are particularly interesting and important:**

- First, recreational drone keepers are forbidden to fly in any sort of controlled airspace.
- Second, if anyone wanted to fly in controlled airspace, he/she had to notify the air traffic authority of where you intended to fly in order to confirm there would be no other craft in the sky at the time.
- The FAA introduced LAANC (Low Altitude Authorization and Notification Capability) system. This system provides the right of entry to controlled airspace





through near real-time processing of airspace authorizations below approved altitudes.

## 5. Drone Registrations

**Drone registration is mandatory when you fly a drone in the US. So, check what kind of a drone flyer you are. As per FAA requirement:**

- Register the drone under Part 107 whenever you fly.
- The label registration number on your drone before fly dive.
- List item

**Proper registration requires the following documents:**

- Email address
- Make and model of your unmanned aircraft
- Credit or debit card
- Mailing address and Physical address

## 6. Recreational Drone Registration

- You should register as a “modeler”, If you are flying for hobby or recreation
- Label your aircraft with your registration number

**In order to register, you should be:**

- 13 years or older age
- A U.S. citizen
- Email address
- Credit or debit card
- Mailing address
- Register online (must weigh less than 55 pounds).
- Register an unmanned aircraft by paper.

## 7. FPV Drone Laws

For FPV drone flying, you want to make sure you're doing it lawfully. The FAA is continually evolving its rules for this hobby as it is relatively new.

- **Register with the FAA**  
Registrar your drone above 0.55 lbs and at this time the cost is \$5.00 for 3 years. If you're flying commercially you must also pass a test and undergo TSA security screening.
- **Maintain Line-Of-Sight (LOS)**  
This law emphasizes to maintain Line-Of-Sight (LOS) with your aircraft. It means if you're wearing FPV goggles you **MUST** have a spotter that can maintain LOS with the aircraft.
- **Never fly near/over people**  
Drones can be dangerous and many people are afraid of them.so, Flying directly over people will be considered assault.
- **Stay below the maximum altitude**







In the United States, you can't fly more than 400 feet off the ground, or 400 feet above any structure. Going above 400 feet could put you into the paths of helicopters and small airplanes, which poses a great risk to their safety. Sometimes this is hard to judge the height, so it's recommended to install some kind of altitude sensor on your aircraft.

- **Never fly near an airport**

You can't under any circumstances fly within 5 miles of an airport without permission from the air traffic controller.

To tackle this issue, you must register with a local flight club. Many towns have a field that is used to practice flying hobby aircraft, and they handle the legal matters to make that area safe to fly. Then you just have to work within the flight club's rules.

- **Don't fly after dark**

Don't fly 30 minutes after sunset or 30 minutes before sunrise. You can look up when the official sunrise and sunset times are for your town and make sure you fly during safe times.

## 8. Privacy and data protection

With the federal government likely to permit more widespread use of drones, and the technology likely to become ever more powerful, the question becomes: what role will drones play in American life? Based on current trends—technology development, law enforcement interest, political, and also reconnaissance and surveillance purposes, industry pressure, and the lack of legal safeguards – it is clear that drones pose a looming threat to Americans' privacy. The reasons for concern reach across a number of different dimensions: industry pressure, and the lack of legal safeguards – it is clear that drones pose a looming threat to Americans' privacy.

In comparison with other countries' regulatory framework on drones, the USA's one doesn't provide any data protection elements. These provisions are stipulated in the Fourth Amendment of the U.S. Constitution that provides that "the right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized".

The Fourth Amendment to the United States Constitution safeguards Americans' privacy and prevents excessive government intrusion by prohibiting "unreasonable searches and seizures." Courts have long grappled with how to apply the text of this 18th century provision to 20th century technologies. Although the Supreme Court has the final say in the interpretation of the Fourth Amendment and other constitutional safeguards, the Congress and, in many cases, the President are free to institute more stringent restrictions upon government surveillance operations.





The ultimate goal of this provision is to protect people's right to privacy and freedom from arbitrary governmental intrusions. Private intrusions not acting in the color of governmental authority are exempted from the Fourth Amendment.

To have standing to claim protection under the Fourth Amendment, one must first demonstrate an expectation of privacy, which is not merely a subjective expectation in mind but an expectation that society is prepared to recognize as reasonable under the circumstances. For instance, warrantless searches of private premises are mostly prohibited unless there are justifiable exceptions; on the other hand, a warrantless seizure of abandoned property usually does not violate the Fourth Amendment. Moreover, the Fourth Amendment protection does not expand to governmental intrusion and information collection conducted upon open fields. An Expectation of privacy in an open field is not considered reasonable. However, there are some exceptions where state authorities granted protection to open fields.

A *bivens* action can be filed against federal law enforcement officials for damages resulting from an unlawful search and seizure. States can always establish higher standards for searches and seizures than the Fourth Amendment requires, but states cannot allow conduct that violates the Fourth Amendment.

The protection under the Fourth Amendment can be waived if one voluntarily consents to or does not object to evidence collected during a warrantless search or seizure.

As evidenced by the foregoing, the constitutionality of domestic drone surveillance may depend upon the context in which such surveillance takes place. Whether a targeted individual is at home, in his backyard, in the public square, or near a national border will play a large role in determining whether he is entitled to privacy. Equally important is the sophistication of the technology used by law enforcement and the duration of the surveillance. Both of these factors will likely inform a reviewing court's reasoning as to whether the government's surveillance constitutes an unreasonable search in violation of the Fourth Amendment.

## 9. Authorities involved in regulation and supervision of Drones operations

The National Airspace System (NAS), the Federal Aviation Administration (FAA), the Office of the Secretary of Transportation (OST), and the Department of Transportation (DOT) are the authorities in charge with the regulation and supervision of Drones operations in USA.

## 10. Enforcement measures

However regulating drones is easier said than done. Unlike cars, drones are not limited to normal streets and roads, so you can't just pull someone over and check their license.

Drones are sold in stores and online as completed crafts, as kits with instructions, and as individual parts. Many people build drones by following plans available online





or designing their own. This makes it very difficult, if not impossible, to regulate the sale of drones.

Many people use drones for purposes, both professional and personal, which need to be regulated differently. In some cases, it isn't clear who should be responsible for this regulation.

The simple fact is that if someone really wants a drone, no amount of laws or regulations will stop them. Some commercially available drones now come with built-in no-fly zones using GPS guidance to warn drone pilots of no-fly zones and automatically ground drones before reaching them. But there is no such control for DIY systems.

If a person wants to use their drone for illegal or malicious purposes, it would be beneficial for law enforcement to be able to stop it before it becomes a danger. In addition, non-destructive countermeasures are important, as they allow law enforcement to use the drone as evidence in a legal case, investigate it to find out where and who it came from, or even return it to the user in the event of an innocent misunderstanding or accident.

Besides the obvious (but dangerous and expensive) idea of just shooting a drone down, there are several groups developing ways to bring drones to ground. Non-profit research organization Battelle is developing their Drone Defender, essentially a large directional antenna which transmits a powerful signal to disrupt or block control and GPS signals to and from a drone. This would bring the craft down without the use of any physical intervention.

At the moment, due to FCC regulations, the device cannot be used in the US by anyone except the federal government, including Battelle themselves. They claim, however, that federal tests have been successful.

Normally, the FAA uses its own agents, and has its own enforcement mechanism. At least in theory, normal police

can arrest a person or otherwise enforce FAA legislation. Along with new provisions for consumer UAS will come provisions granting local law enforcement justification over non-FAA controlled airspace.







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## State of Art of drone laws in Partner Countries





## Republic of Armenia

According to the information posted by Civil Aviation Committee of the Republic of Armenia on the website, the specific legislation of the drone domain is being updated.

The regulation does not concern the unmanned aircrafts weighting less than 250 grams, toy unmanned aircrafts (for kids) and exploitation of unmanned aerial vehicles in private closed areas. People younger than 14 will be allowed to operate drones under the supervision of an adult

Until the new legislation is adopted, people using drones in the Armenian airspace are asked to consider the following general rules:

### 1) DO NOT

- Do not make any changes to the drone, unless approved by the manufacturer;
- Do not fly higher than 50 m from the ground unless permitted by the Civil Aviation Committee;
- Do not operate the unmanned aircraft in the evening, at night, in the dark time;
- Do not operate unmanned aircraft over the cities, streets, park areas and in the airspace where operation of unmanned aircraft has been preliminarily restricted;
- Do not operate unmanned aircraft in congested and crowded areas;
- Do not operate unmanned aircraft over the building and playing-fields, in close vicinity to traffic, high-tension power lines and radars;
- Do not operate the unmanned aircraft in close vicinity to aircrafts, airports and aerodromes. The horizontal distance to controlled restricted area of aerodrome shall be not less than 7 km;
- Do not operate unmanned aircraft for unlawful purpose. Making an aerial photography in general public or private property is possible only with a permission from the owner of such property. Keep in mind that personal privacy and inviolability of private property is warranted and protected by the Armenian law.

Keep in mind that the owner/operator of unmanned aircraft has the full responsibility for its safe operation. Improper operation of UAVs may endanger the aviation and public safety;

### 2) DO

- Strongly follow the requirements by the existing **"56N GDCA order of 2007 year"** (updated in 2016);
- Make sure you are adequately insured;
- Check your drone before each flight; make sure the electronic identification and geo-awareness system (if installed) of your drone is up-to-date;







- Operate your drone within the performance limitations defined in the instructions provided by the manufacturer. Before operating the unmanned aircraft, make sure that all of its elements work properly;
- Continuously maintain visual contact with unmanned aircraft without using any supporting devices (telescope, binocular, electro optical image amplifier). It is prohibited to operate unmanned aircraft at height more than 50 m above terrain or water surface, without special permission;
- Familiarize yourself with the area where you want to operate your drone, plan your flight;
- Check the weather conditions. Operation of unmanned aircraft in adverse weather conditions may be dangerous both for you and surrounding persons, and be destructive for the device;
- Inform Civil Aviation Committee if your drone is involved in an accident, that resulted in a serious or fatal injury to a person, or that affects a manned aircraft.

To make sure you don't get in trouble or get your drone taken away, we recommend contacting Armenia's General Department of Civil Aviation:

E-mail: [gdca@aviation.am](mailto:gdca@aviation.am);

Phone: +374 10 282 066

## Belarus

Analysis official sources of information on the legal planning and carrying out activities flying unmanned aircraft is hampered by the fact that the documents are only identified in language Belarusian/Russian.

The following normative acts have been identified as being applicable to the field of unmanned aircraft, currently:

- Air Code of the Republic of Belarus (*ВОЗДУШНЫЙ КОДЕКС РЕСПУБЛИКИ БЕЛАРУСЬ* 16 мая 2006 г. № 117-3) last amendment (*ЗАКОН РЕСПУБЛИКИ БЕЛАРУСЬ ОТ 13 ИЮНЯ 2018 Г. № 112-3*);
- RULES the use of aircraft models in the Republic of Belarus, approved by the Resolution of the Council of Ministers, Of the Republic of Belarus, 16.08.2016 No. 636 (*ПРАВИЛА использования авиамodelей в Республике Беларусь / Постановление Совета Министров Республики Беларусь 16.08.2016 № 636*);
- List of zones prohibited for the use of aircraft models in the Republic of Belarus;

### 1. Classification of drones

According to the Belarusian legislation, the drones are divided into two groups:

- Aircraft models, (see "RULES the use of aircraft models in the Republic of Belarus");





- Unmanned aerial vehicles (all others).

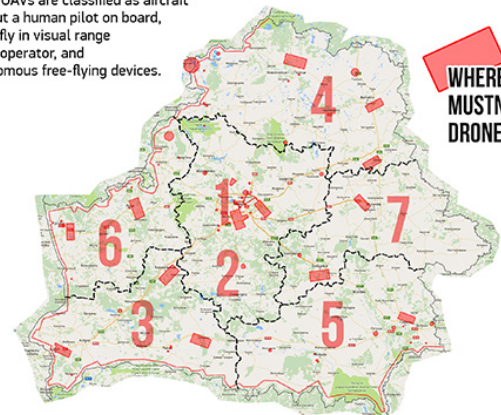
## 2. The requirements for registration of Drones

- Aircraft models are not subject to state registration, aircraft models with gross mass more than 0.5 kg should be marked by the owner (information about the owner of the aircraft model, the address of the individual or the name of the legal entity and its location should be indicated);
- All Unmanned aerial vehicles (UAVs) are subjects to state registration like the manned aviation. They should be registered with the Department of Aviation of the Ministry of Transport and Communications of the Republic of Belarus. A certificate of the type of civil aircraft issued by a competent authority of a foreign state or international organization and recognized in the Republic of Belarus (except civil aircraft of amateur design and assembly kits); copies of documents confirming the legality of possession of a civil aircraft or the acquisition of its components (engine, main components) - in the case of a self-made civil aircraft; a copy of the certificate of acceptance and transfer of civil aircraft - if available; an act of checking the technical condition of a civil aircraft, drawn up by a technical commission or an operator's commission are required for the state registration;

## DRONE FLIGHT RESTRICTIONS



The Belarusian Defense Ministry has extended the list of locations where unmanned aerial vehicles must not be flown. UAVs are classified as aircraft without a human pilot on board, which fly in visual range of the operator, and autonomous free-flying devices.



WHERE YOU  
MUSTN'T FLY  
DRONES?

- 1** Minsk – 14 locations, including:  
center of the city;  
diplomatic town;  
Pobeditelei Avenue;  
Nezavisimosti Avenue;  
northern part of the Minsk ring road;  
Minsk Arena;  
Chizhovka Arena;  
Independence Palace;  
Lipki airfield;  
Beijing Hotel area;  
Minsk One Airport area.

- 2** Minsk Oblast – 22 locations, including:  
Minsk National Airport;  
Machulishchi;  
Ostroshtsky Gorodok;  
part of the M3 and P80 motorway;  
part of the M2 motorway.

- 3** Brest Oblast – 7 locations, including:  
Brest Airport.

- 4** Vitebsk Oblast – 9 locations, including:  
Vitebsk Airport;  
western and northern parts of Postavy.

- 5** Gomel Oblast – 12 locations, including:  
Gomel Airport;  
southern part of Rechitsa.

- 6** Grodno Oblast – 13 locations, including:  
western part of Grodno, including OAO Grodno Azot;  
eastern part of Lida and an area to the west of the city;  
Belarusian nuclear power plant.

- 7** Mogilev Oblast – 3 locations, including:  
Mogilev Airport;  
area near the villages of Brozhka, Tugolitsa, Telusha to the south of Bobruisk.

Drones cannot be flown in the restricted areas without authorization from government agencies.

Drone flights are also restricted along the borders with Ukraine, Poland, Lithuania, and Latvia.

In the rest of the country drones can be flown up to 100m above ground or water.

Source: Defense Ministry resolution No.19 of 27 September 2017.

© Infographics

## 3. Requirements for remote pilots.

- Aircraft models do not have any special requirements for operators;





- The operators of UAVs should take a course of theoretical training (according to the special programs) and practical exercises on simulators and pass tests;

#### 4. Requirements for operations (altitude, restricted areas, etc.).

- Aircraft models should operate at an altitude exceeding 100 meters from the level of the terrestrial (aquatic) surfaces. There is the List of zones prohibited for the use of aircraft models in the Republic of Belarus. Besides, there are territories where photo- or videotaping is prohibited (Regime objects, such as metro, pipelines, some military bases, etc., according to the list, issued by the Council of Ministers; Aircraft; Border transition posts; Embassies);
- All UAV flights in the airspace of the Republic of Belarus are performed according to the rules of visual flights and rules of instrument flights, that act for the manned aviation. UAV flights are performed in accordance with the planned table of flights from the aerodromes, permanent and temporary landing areas (like for the manned aviation). Every UAV flight is performed in accordance with the flight plan. The flight plan should be presented to the appropriate body of the air traffic management system of the Republic of Belarus. All no-fly zones for the manned aviation are the no-fly zones for the UAVs.

Both the Aircraft models and the UAVs should use certain radio frequency bands and have radiation capacities not higher than allowed. If the radio equipment uses the allowed frequency band but has a radiation power higher than allowed it is possible to apply to the commission of the regulatory body under the Ministry of Communications to get the permission, the commission examines the request and, if so, the owner should contact the Republican Unitary Enterprise for Telecommunications Supervision to get a permission to use the drone.

#### 5. Privacy data protection.

Belarusian legislation does not have any special acts that protect private data from the possible Drones threats. The Belarusian legislation provides punishment for the fact that personal data have been disseminated and it doesn't matter how have these data been obtained. Belarusian legislation has much less in the area of preventing the obtaining the personal data than in the area of punishing afterwards.

Personal data is protected by Art. 22.13 of the Code of Administrative Offenses and Art. 179 of the Criminal Code.

#### 6. Authorities involved in regulation and oversight of Drones operations

The Armed Forces Department for the Use of the Airspace of the Republic of Belarus is the state regulator in the field of the Drones use.

The Department of Aviation of the Ministry of Transport and Communications of the Republic of Belarus registers the UAVs.







All supervising bodies of the manned aviation (air traffic management bodies, airfield management bodies and so on) perform their functions to control the UAVs operation.

The Republican Unitary Enterprise for Telecommunications Supervision controls the use of the radiating equipment on the Drones.

## 7. Enforcement measures

There is no of particular enforcement system that prevents the unauthorized use of Drones in Belarus. If a drone comes to the no access area, the police patrols visually detect the drone, track it as it gets back to the owner and apprehends the owner. All other measures are applied to the drone owner according to the Belarussian legislation.

The persons who have broken the legislation in the field of drone use are taken to the administrative liability.

As for the protection of the private data, the system aims at bringing to trial the ones guilty in dissemination of private information that has caused harm for a person. Art. 179 of the Criminal Code provides the criminal liability in the form of fines, public works or arrest for the illegal collection or dissemination of information about private life that constitute a personal or family secret of another person without his consent, which has caused harm to the rights, freedoms and legitimate interests of the victim. In addition, a citizen can be filed a civil action for compensation of moral harm due to violation of the right to privacy.

### Georgia

Georgian Civil Aviation Agency (GCAA) developed set of regulations related to safe operation and certification of the Unmanned Aircrafts (drones) as well as their integration into the civil aviation system of Georgia.

Prior to putting the regulations in place, in order to ensure safety of civil

**FLYING SAFELY**

**Know your surroundings**  
Some municipalities prohibit the operation of remote controlled aircraft within public spaces such as parks and school grounds. There are rules of the air you need to know. Always check with local authorities before you fly your drone.

- ✓ Fly below 400 feet
- ✓ Fly within visual line of sight
- ✓ Avoid flying over groups of people and stadium events
- ✓ Avoid flying near other aircraft
- ✓ Never fly within 5 miles of an airport without contacting airport authorities and the airport's traffic control facility
- ✓ Be aware of FAA airspace requirements [faa.gov/go/uasftr](http://faa.gov/go/uasftr)
- ✓ Keep well away from emergency response efforts such as fires
- ✓ Do not fly under the influence

**Recreational or commercial use?**  
Using a drone in connection with a business is considered to be commercial use by the FAA. This includes but is not limited to:

- Real estate, wedding or other photography
- Inspection or survey services
- Film or television production

Visit [faa.gov/uas](http://faa.gov/uas) for more information  
Go to [knowbeforeyoufly.org](http://knowbeforeyoufly.org) to stay up to date on how and when you can fly your drone.

KNOWFLY, Federal Aviation Administration, FAUVSI





aircraft, people and their property, Georgian Civil Aviation Agency, based on the new regulatory framework for drones by the European Aviation Safety Agency (EASA), has developed the simple recommendations which must be taken into consideration by the Unmanned Aircraft owners/operators.

Since the application of the unmanned aircraft for different purposes becomes more and more important and the number of unmanned aircraft owners/operators increased significantly both in Georgia and abroad, alongside the development of the regulation, the Agency will start the identification of the unmanned aircraft owners/operators in Georgia.

Set of regulations for the safe operation of the Unmanned Aircrafts in an open category will take into effect from September 1, 2017.

Registration, as well as set of regulations for the special category of the Unmanned Aircrafts will come into effect from November 1, 2017.

Certification of the Unmanned Aircrafts will come into effect from January 1, 2020

Before the regulations come into effect GCAA developed a set of recommendations that the operators of the Unmanned Aircrafts have to follow for their safety and the safety of the public.

Below is the brief summary of GCAA regulations and recommendations:

- Before operating of unmanned aircraft, make sure that all of its elements work properly. Ensure the operation of the aircraft in accordance with the Manual provided by the manufacturer.
- Before commencing the operation of unmanned aircraft, check the weather forecast. Operation of unmanned aircraft in adverse weather conditions may be dangerous both for you and surrounding persons, and be destructive for the device.
- It is prohibited to operate unmanned aircraft over the cities, streets, park areas and in the airspace where operation of unmanned aircraft has been preliminarily restricted. Do not operate unmanned aircraft in congested and crowded areas (number of people in crowded area should not exceed 12 persons).
- Do not operate unmanned aircraft over the building and playing-fields, in close vicinity to traffic, high- tension power lines and radars.
- It is prohibited to operate the unmanned aircraft in close vicinity to aircrafts, airports and aerodromes. The horizontal distance to controlled restricted area of aerodrome shall be not less than 5500 m.
- Continuously maintain visual contact with unmanned aircraft without using any supporting devices (telescope, binocular, electro optical image amplifier). It is prohibited to operate unmanned aircraft at height more than 150 m above terrain or water surface.
- It is prohibited to operate unmanned aircraft for unlawful purpose. Do not use unmanned aircraft to make an aerial photography general public or private property. Keep in mind that personal privacy and inviolability of private property is warranted and protected by the Georgian law.
- Keep in mind that the owner/operator of unmanned aircraft has the full responsibility for its safe operation. Improper operation of UAVs may endanger the aviation and public safety.





## 1) Regulatory framework of Drones

Requirements for registration of Drones from 5 kg to 150kg:

1. UAV that are more than 5 Kg cannot operate without registration from CGAA;
2. Can be registered by individual older than 16 years, or organization;
3. Can be registered only on one individual, or organization;
4. Registration does not have expiration and is valid for the lifetime of a drone. CGAA can ask for the confirmation of the existence of the drone every 2 years;
5. Each UAV will be assigned 5 digit number in registration database;
6. The owner of the UAV is responsible for keeping documentation of registration and the state of the drone as it was registered;
7. If the UAV gets destroyed or gets moved and registered in a another country the owned of the drone is supposed to notify CGAA;
8. To receive registration certificate the owner should present the following documents to CGAA:
  - a. Application form.
  - b. Receipt of paid fees.
  - c. Copy of ID (if it is individual).
  - d. Technical specs of a drone.
9. Registration certificate will be issued, but it is only to operate the drone and not the document that proves the ownership;
10. If the weight of the drone equal or exceeds 150kg, then the registration rules are determined by #205 decree of CGAA from October 11, 2013;
11. Drones that are under 250 g are not regulated by these rules. They are considered toys (toy unmanned aerial vehicles are defined as following: flying machine designed or designed for children to play with, the maximum height of its flight does not exceed 30 meters above the ground, and the potential energy is 79 joules);

## 2) Requirements for remotely pilots, operations (altitude, restricted areas, etc.)

- The operator of UAV should be cautious not to approach the flying object that is operated by human inside the object. Operator should keep safe distance and follow the rules established for flying objects.
- If two UAV's are operating on the same height and are getting closer, whoever sees the UAV on the right side should give the right of way. If one UAV is passing another one, the one who is passed has priority. The one who is passing has to make sure that it is safe.
- It is prohibited to transport humans via UAV.
- It is prohibited to operate 2 or more UAV with one remote control device
- Every accident that happens with UAV's, the operator(s) of UAV has an obligation to notify CGAA within 72 hours of the accident.







- It is prohibited to cross the border of Georgia without asking for a permission of CGAA. If the operator plans to cross the border from Georgia to another country, CGAA will have to obtain permission from the authorities of the other country.
- It is prohibited to operate UAV above the sea without the authority's permission. Technical specifications and equipment of the UAV should be appropriate to the environment it operates within.
- It is prohibited to use autonomous UAV with on-board computers for control

### 3) UAV models - drones:

- Maximum operation height 400ft (122m)
- Maximum speed 160km/h
- Radiofrequency of operation should be different from the one used in aviation Only permitted in "G" areas specifically allocated by CGAA in advance
- To get permission the following documentations must be submitted to CGAA: area coordinates in WGS84 standards, operating manual, the area should not be longer than 2,000 meters horizontally and 122m vertically

### 4) Classification of UAV

Operation of UAV are classified by an open category and special category.

- a. Operation of UAV in open category does not require a special permit from CGAA. Operation of UAV fall into open category if drone operation is:
  - 50 m away horizontally to a group of people, or an individual, unless it is in direct possession of an operator;
  - 50 m away horizontally and vertically from roads, and railways;
  - 50 m away from buildings, unless the operator is the owner of the building, or has a permission from the owner;
  - 6 km away from the airports;
  - Within line of sight;
  - With original manufacturer parts (not modified);
  - Weight of drone is less than 25 kg;
  - Speed is not more than 54 km/h;
  - No substances are thrown from drone;
  - Nothing gets transported with a drone;
  - Operation height does not exceed 122 m (400 ft);
  - If operator is under 14 years should be under adult supervision

In all other circumstances the category of operation falls under specific and permit for operation is needed.

- b. Operation of UAV in specific category





In the case of remotely operated aircraft, the type of work you perform, the type of work, the services, etc. Requires conditions different from the operating norms set for the open category. You are treated under a specific category.

It is not allowed to operate a remote-controlled aircraft in a specific category without the agreement of the agency. Primary consent for operation is issued for a period of up to 1 year, and each subsequent consent is issued for a period of up to 2 years. To obtain consent, you must submit:

- statement;
- Information related to the operation of the unmanned aerial system (system, operational characteristics, technical capabilities, emergency situations, system malfunctions, hazard assessment, etc.);
- Geographical coordinates and flight altitudes are intended for flight / flights;
- "Unmanned Aerial Vehicle Insurance" published by the manufacturer.

### 5) Privacy data protection

No specific privacy data protection is mentioned in the regulations, except minimum distance to keep away from buildings and other people.

### 6) Authorities involved in regulation and oversight of Drones operations

Taking into account EC and ICAO recommendations as well as international standards and recommended practices in this sphere, in accordance with the Law of Georgia "On the Management and Regulation of Transport Field" The Legal Entity of Public Law – Civil Aviation Agency was created on 15 April 2011 under the umbrella of Ministry of Economy and Sustainable Development of Georgia.

The Agency is responsible for the monitoring and development of Civil Aviation in Georgia, realizes State administration and safety oversight in this sector, develops regulations and procedures, carries out supervision over its fulfillment and provides related services.

### 7) Enforcement measures

Enforcement measures include confiscation of a drone, and possible criminal charges

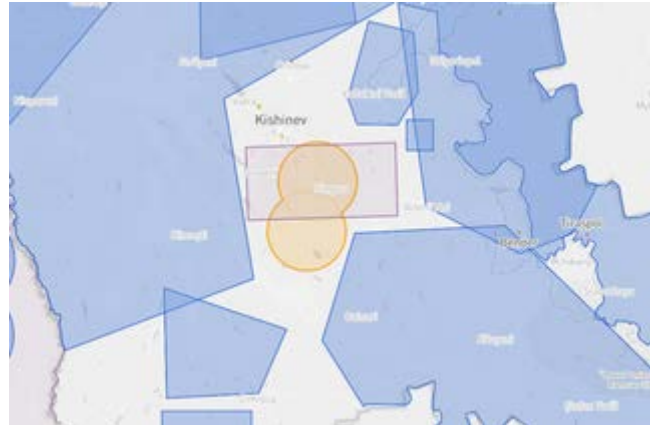
## Republic of Moldova

Drone use is allowed in Republic of Moldova, but drone regulation is currently under reviewing process. The official website of the Civil Aviation Authority of Moldova mentions that the legislation to be adopted will take into account the provisions of the European common rules:





1. Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91;
2. Commission Delegated Regulation (EU) 2019/945 of 12 March 2019 on unmanned aircraft systems and on third-country operators of unmanned aircraft systems;
3. Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft.



Until the date of promotion and approval of the national legislation, operators must ensure that they follow the following drone laws when flying in Moldova:

- Do not fly your drone over people or large crowds;
- Respect others privacy when flying your drone;
- Do not fly your drone over airports or in areas where aircraft are operating;
- You must fly during daylight hours and only fly in good weather conditions;
- Do not fly your drone in sensitive areas including government or military facilities. Use of drones or camera drones in these areas are prohibited.

To make sure you don't get in trouble or get your drone taken away, we recommend contacting Moldavian's Civil Aviation Authorities:

- E-mail: [info@caa.gov.md](mailto:info@caa.gov.md);
- Phone: (+373) (22) 52 40 64 / (+373) (22) 823 500.





## Legislative proposal





## 1. Commercial Drone Market Overview:

The global commercial drone market was valued at \$2,145 million in 2015, and is projected to reach \$10,738 million by 2022, growing at a CAGR of 26.2% from 2016 to 2022.

The growing adoption of smartphones, rising demand for aerial services, and increased demand for drone services from various sectors would supplement the growth of commercial drone market. Leading players are aiming to explore new technologies and applications to meet the growing demands of customers. Collaborations and acquisitions would enable them to enhance their product portfolios and expand into different geographies.

Emerging economies would provide opportunity for growth and expansion. Vendors are developing specialized solutions for small and medium-sized businesses to meet their specific business requirements. Stringent government regulations regarding national security and satellite imagery as a substitute option are expected to hamper the commercial drone market growth. Another possible restraint is the increasing adoption of satellite imagery that can limit the growth of commercial drone market.

U.S. commercial drone market size, by application, 2014 - 2025 (USD Million)

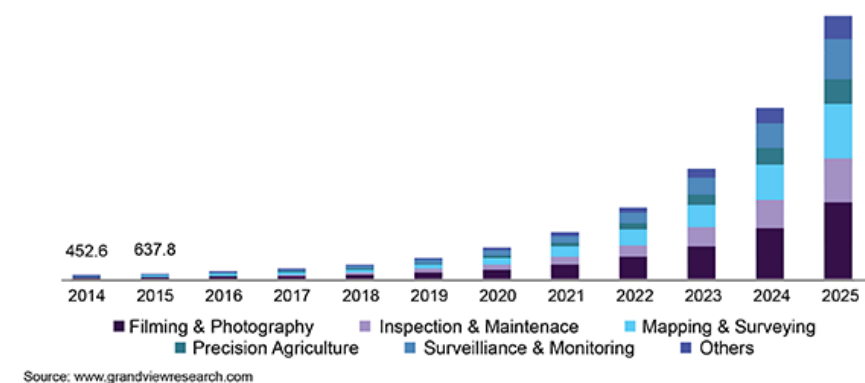
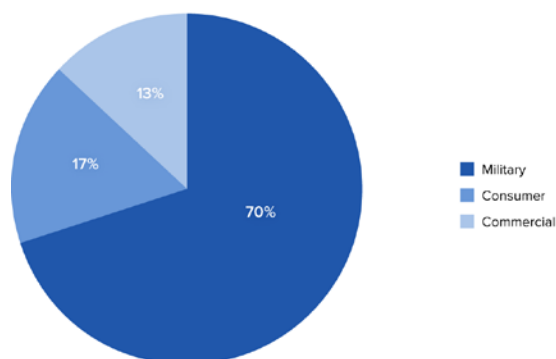


Chart 1: Drone Market by Sector



## 2. Segment Overview and Analysis

The report covers the study of the commercial drones market, focusing on three types of products including fixed wing drones, rotary drones, and hybrid drones. The commercial drones market is divided into six major sectors according to their application, which include agriculture & environment, media & entertainment, energy, government, construction & archaeology, and others.

The report also covers key trends and opportunities of drone products across various geographical regions including North America (U.S., Canada, Mexico), Europe (UK, France, Germany, and Rest of Europe), Asia-Pacific (India, China, Japan, South



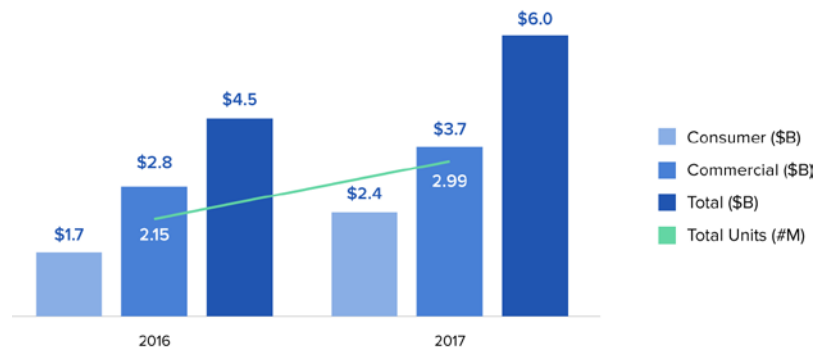


Korea, and rest of Asia-Pacific), and LAMEA (Latin America, Middle East and Africa). The drivers, restraints, and opportunities present in the market are explained in the report along with the analysis of their impact. The report describes key strategies adopted by market leaders to facilitate effective planning for the growth and development of the commercial drone market.

### 3. Top Impacting Factors

Prominent factors affecting the world commercial drone market include technologically advanced products, privacy and security concerns, rising demands of high resolution satellite imagery, and research & development initiatives. Majority of these factors have led to increase in adoption of commercial drones across different parts of the world.

Chart 2: Drone Market Revenues by Sector



Source: Gartner



**Top impacting factors for global commercial drone market are elaborated below:**

#### a) Global/national legislative framework

The legislative framework specific to the field of unmanned aircraft is being developed and harmonized at a global level. Through the intermediary and in the coordination of the different civil aviation groups/organizations, at present, different regional/national projects are underway, whose final aim is to harmonize the specifications of personal and technical certification at regional level. The need to identify optimal ways of developing and promoting standards, harmonized globally, for the certification of personnel and technology, is the key to the sustainable development of this field;

#### b) Technologically Advanced Products

Digitization and technological advancements in camera, drone specifications, mapping software, multidimensional mapping, and sensory applications are expected to fuel the commercial drone market growth during the forecast period. Persistent innovations in the market and emergence of technologically advanced products, such as Mavic Pro by SZ DJI Technology Co., Ltd.; Hero5 camera by GoPro, Inc.; SPECTRO XR (Extra Range), a multispectral electro-optic system by Elbit Systems Ltd.; and M-19HD by







Israel Aerospace Industries Ltd. launched by industry players, have increased the demand for the drone market in the recent years.

**c) Privacy and Security Concerns**

Privacy issues and national security regulations are expected to negatively affect the market in the coming years. Aerial services sometimes require filming and photography in civilian areas, which affects the privacy of people. Most of the countries in Asia-Pacific and the Middle East do not have effective rules for aerial imaging & mapping services. On the contrary, countries such as the U.S. and U.K. have regulations specified for aerial services, but there is a lack of clarity and implementation in the regulatory framework, which would negatively affect the commercial drone market growth.

**d) High-Resolution Satellite Imagery as a Substitute**

Earlier, satellite imagery was a costly proposition, but now companies focus on developing technologically advanced, high precision, and cost effective imagery solutions. One such example is the WorldView-satellite by DigitalGlobe, which offers high definition panchromatic images. Satellites can perform services such as mapping, GIS, LiDAR, surveillance, and others. Additionally, satellite services do not have any regulatory issues as opposed to aerial imagery, thus negatively affecting the commercial drone market share during the forecast period.

**e) Increased Application Areas for GIS, LiDAR, Mapping Services, and Others**

Increase in demand for GIS, LiDAR, and mapping services from various sectors such as agriculture, energy, tourism, and others fuels the commercial drone market growth. The agriculture sector is experiencing effective changes in yield production, enhanced crop health management, and improved soil condition with the implementation of LiDAR, GIS, and other mapping services. Real estate and civil engineering sectors are advancing in terms of new technology adoption such as multidimensional modeling, architectural planning, and monitoring civil engineering projects. Additionally, drones are used for various purposes, including research & exploration, archeological surveys, mining, cargo management, telecom network management, oil & gas resource management, and others. The rise in application areas is expected to boost commercial drone market growth during the forecast period.

**f) Pandemic/economical crises**

Artificial Intelligence (AI), Virtual Reality (VR), and Augmented Reality (AR) solutions are anticipated to substantially contribute while responding to the





COVID-19 pandemic and address continuously evolving challenges. The existing situation owing to the outbreak of the epidemic will inspire pharmaceutical vendors and healthcare agencies establishments to improve their R&D investments in AI, acting as a core technology for enabling various initiatives. The insurance industry is expected to confront the pressure associated with cost-efficiency. Usage of AI can help in reducing operating costs, and at the same time, can increase customer satisfaction during the renewal process, claims, and other services. VR/AR can assist in e-learning, for which the demand will surge owing to the closure of many schools and universities. Further, VR/AR can also prove to be a valuable solution in providing remote assistance as it can support in avoiding unnecessary travel.

## 4. Drone market trends and forecasts

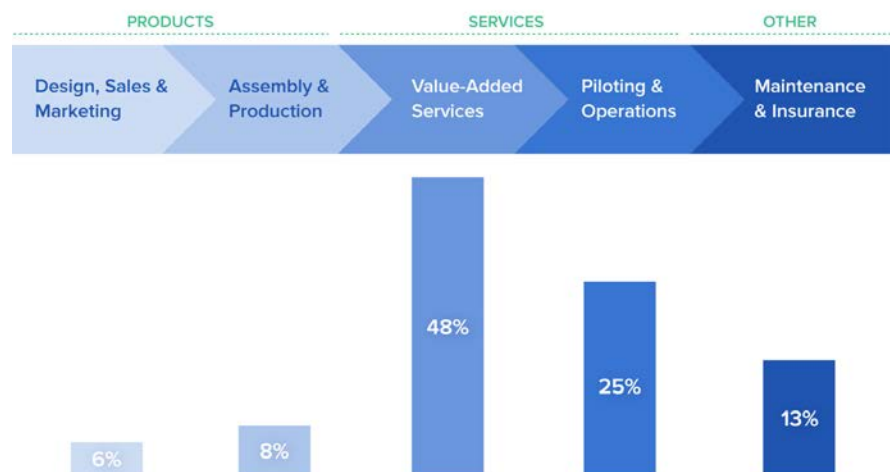
Drones for the enterprise hold the most potential in the broader drone market.

Business Insider Intelligence defines

enterprise drones as all unmanned aerial vehicles (UAVs) sold directly to a business for use in its operations.

Under that criterion, Business Insider Intelligence predicts total global shipments to reach 2.4 million in 2023 – increasing at a 66.8% compound annual growth rate (CAGR). Drone growth will occur across the four main segments of the enterprise industry: Agriculture, construction and mining, insurance, and media and telecommunications.

Chart 3: 2050 Revenue Split



Source: Boston Consulting Group

toptal

### a) Drones in agriculture

The UN projects that the world's population will reach a massive 9.7 billion by 2050, causing agricultural consumption to rise 69% between 2010 and 2050. And considering most of the farmers and agriculture companies using drones are big-ag-owned farms that manage thousands of acres of land, the potential for drone growth in agriculture is extensive.





Popular applications for drones in agriculture include crop and livestock monitoring, irrigation management, and fertilization – DroneFly estimates that drones can spray fertilizer 40 to 60 times faster than doing so by hand;

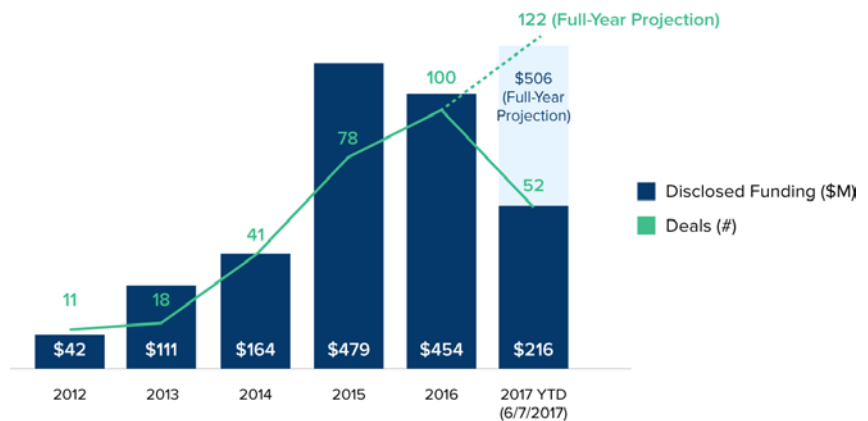
## b) Drones in construction and mining

Drone use in construction and mining could eventually become a \$28.3 billion global market, according to PwC. Businesses within these industries are leveraging drones

Chart 4: Annual Drone Investments

to more easily adhere to the extensive laws and regulations surrounding worker safety.

US laws require construction companies to survey their sites on a regular basis to ensure they're safe for workers.



Source: CB Insights



This process can take from 10 hours to a few days – but with drone technology, inspections can be completed in a quick 15 minutes;

## c) Drones in insurance

It's estimated that the average global annual cost of insurance claims from natural disasters has increased eight-fold since 1970. Because of this, insurance firms will likely leverage drone technology to provide faster and more accurate property assessments.

Enterprise drones can get to hard-to-reach locations immediately after a disaster hits. From there, they can capture precise images and videos of damage that can be transmitted back to mobile devices for assessment in real time. Ultimately, drones can help claims adjusters process property significantly faster than doing so manually.

Having in mind:

- the aforementioned information;
- the provisions of the specific legislative framework for the planning and conduct of flight activities with unmanned aircraft in the national airspace, existing legislative framework in the partner states (Armenia, Belarus, Georgia and Moldova);
- the practical experience gained by the participants following the implementation and management of the "Educational for Drone for (eDrone) project;







and in order to harmonize the normative acts issued in the partner states, as well as their provisions with those existing in the European, North American or Chinese states, here are some proposals that can be mentioned in this report:

1. setting up a working group whose purpose is to
  - evaluate the national legislative framework of the partner states and identify the normative acts with a direct / indirect impact on the field of unmanned aircraft;
  - proposes a national policy applicable to the field of unmanned aircraft;
  - proposes the activities necessary to update the national legislative framework and to harmonize with the regulatory tendencies of this field at European and international level;
2. the working group consists of specialists designated by the partner states and may also include specialists involved in the management of the project "Educational for Drone" (e-Drone).  
Other regional initiatives such as South Asian Regional Initiatives (SARI) can be considered in setting up and operating the working group;
3. until the date of updating the normative acts specific to the field of unmanned aircraft, the identification of legal possibilities for the recognition of documents (licenses, authorizations, etc.) issued by the national civil aviation authorities of the partner states or by other civil aviation authorities for the civil aviation domain ( technical staff and the personnel involved), as follows:
  - bilateral agreements between the partner states for the mutual recognition of the validity of licenses/authorizations/certifications specific to the field of unmanned aircraft;
  - recognition by the other partner states of the agreements agreed by one partner state with other states for the mutual recognition of the validity of licenses/authorizations/certifications specific to the field of unmanned aircraft, in order to duplicate the analysis and negotiation efforts;
4. training the personnel of the national civil aviation authorities and of the national governmental bodies responsible for monitoring the compliance with the legal provisions and the application of sanctions, in order to understand the new tendencies and policies to regulate the field of unmanned aircraft at international level.

