

# A Survey of Drone Regulations Around the World : An In-Depth Look



# Introduction

The newness of drone technology means there is still a great deal of uncertainty regarding what the devices are or are not permitted to do. CerbAir dives into the complex and shifting world of drone regulations.

In this publication you will learn:

- A brief history of drone intrusions & incidents
- A survey of five countries' drone regulations
- Useful links and references on drone regulations



## Introduction

### The Threat Emerges

Before the democratization of UAV (Unmanned Aerial Vehicle) technology in the early teens, there was almost no drone-specific legislation anywhere. Drones and their actions were mostly covered by rules governing civil aviation and lumped in with model airplanes and kites.

A noticeable shift in the attitude of authorities towards consumer drones began around 2014-2015 following a number of high-profile incidents involving drones:

- **September 2013** – A drone piloted by an internet activist flies within one meter of German Chancellor Angela Merkel during a political rally in **Dresden, Germany**. Security experts are alarmed <sup>(1)</sup>
- **October/November 2014** – Unidentified drones are spotted hovering over 13 separate nuclear power plants in **France** in what the Secretariat-General for National Defence and Security describes as an "organized provocation" <sup>(2)</sup>
- **January 2015** – A drone ends up on the White House lawn in **Washington, DC** after the drunken operator loses control of the device. Unnoticed by the Secret Service, the pilot himself called to report the incident, provoking an investigation and raising concerns that the US capital could come under threat from consumer drones <sup>(3)</sup>
- **February – March 2015** – In February a near-miss with a jetliner is recorded at Paris Charles de Gaulle-Roissy International – Europe's second busiest airport. Over the next few months drones are spotted flying over important structures in **Paris, France** including the residence of the French President, the American Embassy and Disneyland Europe <sup>(4)(5)(6)</sup>
- **July 2015** – Unidentified drones are spotted multiple times over the Lyondellbasell chemical plant near Marseille, France. An explosion at the plant shortly after raises (unproven) fears that the drone pilots were somehow involved <sup>(7)</sup>
- **April 2015** – A drone carrying a small amount of radioactive material is discovered on the roof of the offices of the Prime Minister of **Japan** after landing there two weeks earlier. The pilot, who was protesting the use of nuclear energy in the country, received a suspended two-year sentence <sup>(8)</sup>
- **December 2015** – A UAV filming a sporting event in **Italy** suddenly falls from the sky, crashing mere meters behind slalom athlete Marcel Hirscher. The International Ski Federation consequently bans drones for broadcasting purposes from their events <sup>(9)</sup>

### Authorities Take Action

As complaints and reported incidents began piling up, taking many civil aviation authorities by surprise, a serious movement to bring drones and their operators under some sort of government control began taking shape. Although uneven, some common elements appear:

- Limiting maximum flight altitude to **120m (400ft)**
- Restricting drone operation to **within line-of-sight and daytime hours**
- Banning unauthorized drone activity near **airfields**
- **Banning or restricting drone flights over populated areas**
- **Prohibiting drone operation in disaster areas or near emergency operations**

Still, drone regulations remain a subject of confusion for many including drone pilots themselves. In this paper, we will examine drone-related legislation in place in a variety of nations around the world: Japan, the United Arab Emirates, Australia, the United States and France.

**Caveat:** Legislation regarding drones is in constant shift as the technology evolves. This publication is intended to be an informative overview of drone-related regulations in several countries around the world as they stood in February 2019 and is not meant to serve as a definitive guide or legal document on the subject. UAV operators are strongly advised to consult local civil aviation resources on drone regulations for the countries and regions where they intend to fly before operating their devices.



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## United States

The United States has been the center of consumer drone technology since its inception and many drone “firsts” (including the unfortunate **“first documented drone-related aircraft crash”** <sup>(1)</sup>) have happened here. A terrorist plot in 2011 to attack the US Capitol and Pentagon with bomb-wielding drones <sup>(2)</sup>, or a UAV sighting in early 2019 that temporarily shut down Newark Liberty Airport <sup>(3)</sup> illustrate the dangers the country faces from both malevolent as well as merely clueless drone pilots.

Perhaps unsurprisingly, legislation has had a hard time catching up to the quickly evolving world of consumer drones, but a major change came with the approval of the **FAA Reauthorization Act in 2018** <sup>(4)</sup>. The Federal Aviation Authority (FAA) which oversees civil aviation activity in the country has 6 months to implement the new legislation and cautions UAV pilots of all stripes to be on the look-out for new rules as the Act is progressively rolled out.

### Current Situation

With the passage of the new legislation, the drone world in the United States was thrown into a state of uncertainty. For the moment, the FAA has advised pilots to adhere to the current regulations governing drone flights which for **consumer drones under 55lbs** (25 kilos) include <sup>(5)</sup>:

- **Online registration** of all drones over 0.55lbs (250g) and attachment of registration number to device
- Minimum pilot age of 13 to register
- Flight for **hobby purposes** only (commercial pilots must obtain a license)
- Flights restricted to **400ft (120m)** and within line of sight
- Flight during **daylight** hours only
- No flights within a **5-mile (8 kilometer)** radius of airports, military bases and emergency operations unless previously authorized
- No flights over people, public events or heavily populated areas
- Flights above any part of **Washington, DC** (the national capital) are strictly prohibited

**Commercial pilots** are currently regulated by **“Section 107”** of the existing legislation which, among other regulations, requires operators to register their drones electronically or, if the device is over 55lbs (25 kilos) with a paper application. Commercial UAV pilots must pass pilot certification and carry proof of their certification on them whenever they fly <sup>(6)</sup>.

**Tourists** are permitted to bring their devices into the country, but only in their **carry-on luggage**. They must register the device online, **bringing proof of registration with them**, and they are bound by the same regulations as native consumer or commercial pilots <sup>(7)</sup>.

**Flying a drone without registration** or in restricted areas can bring on particularly **stiff penalties with fines up to US\$250,000 (221.000€)** and/or imprisonment for up to three years <sup>(8)</sup>.

The above lists are not exhaustive and additional state and local-level restrictions often apply. UAV operators are advised to check with all relevant authorities before flying.

### Countermeasures: For the Authorized Only

As in most of Europe and Australia, the United States **restricts the use of drone countermeasures to authorized security, police and military personnel**. Persons attempting to take down or intercept a drone may face fines, jail time or be required to reimburse the drone pilot for damages.



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## A Situation in Flux

The FAA was hitherto bound by an exception (“section 336”) in the civil aviation codes which exempted “model aircraft” from its jurisdiction. Drones under 55lbs (25 kilos) were included in that category until now, however the new legislation abolished section 336, bringing the devices directly under the Authority’s control <sup>(9)</sup>.

The FAA has shown a **willingness to work towards the integration of UAV’s into the civil aviation landscape** and committed to studying new ways of doing so, including: allowing beyond line-of-sight and nighttime flights for commercial pilots and allowing drones to fly over crowds in certain circumstances <sup>(10)</sup>.

## Pilot Concerns

However, some commercial and consumer drone pilots are worried by sections in the Act requiring a still-unspecified “electronic pilot test” for all operators <sup>(11)</sup>.

More controversial still are sections requiring visible “identification markings” on all drones that are linked to the operator’s personal information (in the same way that motor vehicles have a license plate) and particularly provisions allowing the FAA and other select federal agencies **to electronically identify, detain and even destroy drones without a warrant** if they deem the drone a threat to security<sup>(12)</sup>.

While most pilots acknowledge the need for clearer rules following numerous drone-related accidents and incidents in the country, as well as recent drone-perpetuated terrorist attacks – they feel that the legislation in its current state is far too broad and could lead to civil rights violations.

The FAA was given 180 days from the passage of the new Act (in October 2018) to announce more specific rules, meaning the situation will continue to shift in the medium term. It remains to be seen if drone pilot objections will be addressed by the clarifications.

## Helpful Link

The Federal Aviation Authority’s page on drone registration and regulations (English):  
<https://www.faa.gov/uas/>



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France, one of the first countries to legislate drone activity (2012) <sup>(1)</sup>, has suffered a number of prominent drone incidents in recent years. In 2018 and again in 2019, the environmental activist group **Greenpeace** sent drones (**one dressed as Superman, the other carrying a smoke bomb**) hurtling into two separate nuclear plants to draw attention to the vulnerability of the facilities to drone attacks <sup>(2)(3)</sup>. In August 2018, just one day after the attempted “assassination by drone” of Venezuelan president Nicolas Maduro, **an unidentified drone entered restricted airspace above the summer residence of the French president** and was promptly neutralized <sup>(4)</sup>, but not before provoking a national conversation on airspace security.

The laws regulating drone flights were recently updated again in July 2018 <sup>(5)</sup>. In France, UAV flights are supervised by the **Directorate General for Civil Aviation (DGAC)** which oversees the security and safety of aircraft operators within French airspace.

### ‘All Flying Devices Are “Aircraft”’

France takes a stricter view of drone classification and considers any “flying device”, even unmanned and small in size, to be an aircraft falling under the DGAC’s control <sup>(5)</sup>.

### General Requirements

In general, French drone regulations resemble those of many other European countries (for which they were often a model). In July 2018 the DGAC released a list of ten rules <sup>(6)</sup> that all drone pilots must adhere to:

- No flights over people
- Maximum flight altitude of 150m (492ft)
- Flights restricted to line of sight and daytime hours
- No flights over urban areas without prior authorization
- No flights within 10km (6 miles) of airports or airfields without prior authorization
- No flights over sensitive sites or monuments without prior authorization
- Respect for the privacy of others
- Aerial photos or videos that capture people or private property may not be reproduced or broadcast without prior authorization
- Subscription to civil liability insurance to cover possible damages
- Always check with national and local authorities before flying

The DGAC has released both an **instructional video** as well as a **smartphone app** which allows UAV operators to consult an interactive map showing **authorized flight zones** <sup>(5)</sup>.

### Category System

Several categories of drones are recognized from **Category A to Category G**. <sup>(5)</sup> The vast majority of consumer drones sold on the market are in Category A – devices weighing less than 25kg (55lbs) and having only one source of propulsion.

France tightened up its legislation on “Category A” consumer drones in July 2018 requiring civilian pilots not only to **register their devices, but to complete an online training course** if they wish to fly any drone weighing **more than 800g (1.7lbs)**. Pilot age for the training course is restricted to 14 and above, meaning children are prohibited from flying devices any heavier than the 800g cut-off <sup>(7)</sup>.

**Commercial pilots of any category** must pass an obligatory training and certification session and register their flights with the DGAC to obtain a flight authorization <sup>(5)</sup>. **Commercial flights are divided into 4 scenarios** depending on the type of device, flight altitude and distance, as well as weight and nature of the cargo carried (if any). Different scenarios types are subject to different restrictions and requirements.





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**Tourists** are currently allowed to bring in consumer drones weighing less than 25kg through customs, but most airlines require the drones to be **carried in hand luggage and lithium batteries to be stored separately in lithium pouches** <sup>(7)</sup>. Tourists intending to make commercial flights must register their devices and comply with regulations on commercial flights. Tourist pilots are expected to respect drone regulations and to be aware of national and local restrictions.

Penalties for not following the rules are high. The **improper use of a drone** in direct violation of the rules set to ensure safety is liable to **one year of imprisonment and to a 75,000 euro (US \$84.500) fine**. And flying over a restricted or prohibited area with a drone is liable to **one year in jail, a 45,000 euro (US\$50.800) fine and drone confiscation** <sup>(8)</sup>.

The above lists are not exhaustive. It is recommended that all UAV pilots consult local aviation authorities before taking to the skies.

## Countermeasures: Not for Everyone

Unsurprisingly, France **bans attempts to intercept or destroy drones with the only exception to this rule being authorized security, police or military personnel** <sup>(9)</sup>.

## Recent Changes

Upcoming regulations will require pilots of **all drones over 800g of any category to “mark” their device both physically and with an electronic ID** <sup>(10)</sup>, most likely WiFi and GPS signals that can be remotely consulted by a smartphone app, in a move to make irresponsible pilots more liable for their actions. The DGAC is working with drone manufacturers to make this possible<sup>(11)</sup>.

## Helpful Link

The Directorate General for Civil Aviation’s page on drone registration and regulations (French):  
<https://www.ecologique-solidaire.gouv.fr/modeles-reduits-et-drones-loisir>



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# United Arab Emirates

It is perhaps unsurprising that the UAE, with its cutting-edge cities and massive tourist numbers, should suffer from a high-tech “drone problem”. Dubai’s international airport, one of the busiest in the region, was forced to close its runways numerous times over 2015 – 2016 due to the presence of consumer drones in its no-fly zone, with every incident costing millions in canceled and delayed flights.<sup>(1)(2)</sup>

The ongoing Yemen War poses an additional threat with Houthi rebels determined to disrupt Emirati air traffic using locally produced UAVs.<sup>(3)</sup> The country’s **General Civil Aviation Authority (GCAA)** reacted quickly, introducing licensing legislation for commercial drones in 2015 and updated laws covering consumer drone registration and regulation in 2016/17, removing a ban on consumer drones in place up until that time<sup>(4)(5)</sup>

## Know Before You Fly

The UAE has national legislation put in place by the GCAA and local regulations set by both the Civil Aviation Authorities of the individual emirates as well as by municipal authorities.

Drone operators are expected to **be aware of the rules on both the federal and local levels**.<sup>(6)</sup> While the chief objective of UAV regulations is to ensure safety, the protection of privacy in a society that considers private life off-limits is an equally important element.<sup>(7)</sup>

## Registration & Licensing

**All drones, both commercial and consumer, must be registered with the GCAA**<sup>(8)</sup>. This includes drones flown by foreign tourists, who must register their devices before entering the country and declare them (showing proof of registration) upon arrival. The GCAA provides online registration through its website. Some emirate-level civil aviation authorities require registration as well.

Commercial drone operators must also obtain a flight license, insurance and an Unmanned Aircraft Operator Authorisation (UOA)<sup>(8)</sup> from the emirate where their activities will take place. Some emirates, like Dubai, specify that commercial drones must be fitted with tracking devices for safety and monitoring.<sup>(9)</sup>

## Consumer Drone Regulations

The GCAA limits consumer drones to a **weight of 5kg (11 lbs) or less**. A few of the many requirements set out for consumer drones include<sup>(8)</sup>:

- **No video or camera devices** may be used in flight without prior authorization (this is a gray area & pilots are advised to check with local authorities) and flights over residential areas are generally prohibited in any case
- Drones may not be flown within **50 meters (165 ft)** of a person or vehicle
- Drones must be inspected before flight and flown in accordance with manufacturer instructions
- Drones may not be used for commercial purposes (otherwise a license must be obtained)
- Operation is permitted only during daylight hours
- Consumer drones are restricted to certain **radiofrequency bands** (29.7-47.0 MHz max power 10 mW, or 2400-2500 MHz max power 100 mW) and **power sources** (battery, not gas)
- Drones may be flown **only in authorized areas**. The GCAA has a smartphone app (“UAE Drone Fly Zone Map”) and online map indicating such “green zones”<sup>(10)</sup>. Operators should also verify emirate and municipal level restrictions



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## Articles 69 & 70

Articles 69 & 70 of the UAE aviation code prescribe heavy punishments of **1-3 years in prison and/or fines of 50 000 – 100 000 dirhams ( US\$13.500 - \$27.000)** for UAV pilots who violate restrictions <sup>(11)</sup>, including:

- Flying without registration
- **Harassment** of others or violation of their private space
- Causing damage to other aircraft or to communication and/or navigational devices
- Flying **within 5km of restricted areas**, including airports, military installations or sensitive sites without authorization
- **Flying while intoxicated** or under the influence of illegal substances
- **Flying beyond the line of sight** (defined as the distance from which a drone may be observed without visual aids such as binoculars)
- Flying above **120 meters** (400 feet)

The above lists are not exhaustive and a prospective UAV operator in the UAE is advised to check with authorities before proceeding.

## Drone Interception – A Matter for Police & Military

For the moment, only authorized parties – the Police, Security and Military forces – are permitted to intercept or neutralize an intruding drone. Individuals who feel a drone pilot has violated their privacy or is harassing them are urged to report the matter to their local police. <sup>(11)</sup>

## Helpful Link

The General Civil Aviation Authority's page on drone registration and regulations (Arabic & English):  
<https://www.gcaa.gov.ae/en/pages/UASRegistration.aspx/>



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歌舞伎町一番街

Japan



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## Japan

Japan amended its Aviation Act and passed a new law in response to an incident in 2015. Yasuo Yamamoto, a 40-year-old environmental activist who was deeply opposed to the use of nuclear energy in Japan, flew a drone loaded with a small amount of radioactive sand over the Prime Minister's office<sup>(1)</sup>. The device landed on the roof and was not spotted by an employee until two weeks later, prompting the evacuation of the building<sup>(2)</sup>. Up until this time, Japan only had laws on the books governing low-altitude flights around airports, but the incident spurred a quick update of legislation.<sup>(3)</sup> Since then Japanese authorities have recorded a spike in illegal drone activity - often linked back to foreign tourists who are unaware of the rules.<sup>(4)</sup> In 2017, drones made headlines again when a device flying over a festival suddenly crashed, injuring 6 including a small child.<sup>(5)</sup>

### Drones Defined and New Restrictions

The **Ministry of Land, Infrastructure, Transport and Tourism**, the Japanese agency in charge of drone regulations, defines a "drone" or "UAV" as an "airplane, rotorcraft, glider or airship weighing over 200 grams that cannot accommodate any person on board and can be remotely or automatically piloted."<sup>(3)</sup>

Under the **amendment to the Aviation Act**<sup>(3)</sup>, UAV operators are prohibited from operating their devices in the following areas without prior authorization:

- Areas where air traffic is expected, such as airports or military bases
- In designated "**Densely Inhabited Districts**" (DIDs) or above gatherings of people
- At a distance of closer than **30 meters to people or objects or more than 150 meters above ground level**
- At nighttime or beyond line of sight
- **Drones may not carry "dangerous items" or drop items while in flight** such as leaflets

The following year, Japan passed the **Act on Prohibition of Flying UAVs over Important Facilities and Their Peripheries**.<sup>(3)</sup> The Act prohibits drones from flying over or within 300 meters of designated "Important Facilities" such as:

- **The Diet** (Japanese parliament building)
- **The Imperial Palace**
- **The office of the Prime Minister** or buildings of government agencies involved in crisis management
- **Embassies** of any nation
- **The Supreme Court**
- **Nuclear power facilities**

Violation of any of these restrictions is punishable by up to **one year in prison** and a fine of up to **500.000 yen**, about **US\$50.000**.<sup>(3)</sup>

It is currently legal to bring a drone into the country as a **tourist**, but operators are advised to check local regulations before flying.

### Hands-Off

It remains **illegal in Japan** to attempt to intercept a drone in flight without prior authorization<sup>(3)</sup>. Though the legislation is flux, for the moment only law-enforcement and military personnel are permitted to do so.

### Future Developments

It is expected that **drone regulations will become even tougher** in Japan, both in preparation for the upcoming 2020 Olympics in Tokyo<sup>(6)</sup> and in response to ever-increasing incidents involving tourists flying over restricted areas. Bans on drone flights at the local level (prefecture and municipal) continue to multiply.<sup>(7)</sup>

### Helpful Link

The Ministry of Land, Infrastructure, Transport and Tourism's "Drone" page (Japanese & English):  
[www.mlit.go.jp/en/koku/uas.html](http://www.mlit.go.jp/en/koku/uas.html)



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# Australia



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## Australia

Drone incidents involving aircraft and drones flown in restricted areas have spiked in Australia as the technology gains in popularity. In 2016 a drone flying at an illegally high altitude came within 50 metres of a Lifesaver Rescue Helicopter in Queensland, seriously endangering the crew <sup>(1)</sup>. Privacy concerns increased as well due to peeping UAS, like the unknown spy drone that terrorised an entire rural community in the state of South Australia in 2017 <sup>(2)</sup>. In response, the **Civil Aviation and Safety Authority (CASA)** has decreed a number of no-fly zones around the nation's airports, military bases and other sensitive sites. On the state and municipal levels, different restrictions abound – the cities of Sydney and Melbourne for example prohibit all unauthorized drone operations within large areas of their city limits, including city parks. The famous Uluru Rock and parts of the Great Barrier Reef are equally off-limits. <sup>(3)</sup>

### Simple but Comprehensive

At the national level Australian drone laws tend to be more streamlined than some other countries and adhere to the principal of not disturbing the tranquility, or endangering the safety of others <sup>(4)</sup>. Regulations include:

- Keeping **below 120 meters** (400 ft) and **above 30m** (98 ft) away from other people or objects
- Avoiding areas where emergency operations are underway, such as car accidents or firefighting efforts
- Avoiding **airfields or military installations** within a 5.5km (18 000 ft) radius
- Not flying over **gatherings or densely populated** areas
- Keeping within line of sight during all operations
- Flying only in daytime
- Not filming individuals or private property without consent

CASA recommends that UAV operators **always check with local authorities before flying** as some may be stricter than others. This particularly applies to national parks, monuments and the coastline.

**Commercial drone pilots** – those flying devices weighing over 2kg (4.5 lbs) for monetary gain – are subject to additional requirements <sup>(5)</sup> including:

- **Attainment of an Aviation Reference Number (ARN)**
- **Remote Pilot Licence (RePL)**
- A **training course** by an approved organization for those without aviation experience or a **flight test and supervised flight hours** for those with aviation experience are also necessary

### Restrictions on Countermeasures

As in most of Europe and North America, attempting to intercept a drone by any means, be they physical or electronic is illegal in Australia for private citizens. Only authorized parties, such as the police and defense forces are permitted to intercept or neutralize a malevolent drone <sup>(6)</sup>. CASA provides an online report form for people wishing to report dangerous drone activity or harassment: <https://www.casa.gov.au/webform/report-unsafe-drone-operations>

### What the Future Holds

Faced with an ever-increasing number of drone complaints, Australia is mulling the introduction of a drone registration system for both consumer and commercial drones <sup>(7)</sup>.

### Helpful Link

The Civil Aviation Safety Authority's page on drone registration and regulations (English):  
<https://www.casa.gov.au/aircraft/landing-page/flying-drones-australia>





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# About CerbAir

Founded in response to an alarming rise in drone security incidents, CerbAir is dedicated to offering the ultimate in anti-drone solutions.

Our in-house development and tool-box approach allow us to provide high-quality and flexible airspace security at a competitive price. With drones set to transform everyday life, CerbAir is committed to keeping our clients' sensitive airspace safe from rogue drone intrusions.

A pattern of drone abuse followed by reactive legislation pumped out by surprised authorities has become the standard in many places. But no matter how well laws are written, some pilots will either miss the message or choose to ignore it entirely. The best strategy to prevent rogue drone intrusions and stop their pilots is an offensive one: installing effective anti-drone solutions capable of evolving with a rapidly changing security landscape.

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and anti-drone solutions

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