



DIGITAL TRANSFORMATION IN JOURNALISM AND NEWS MEDIA



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Multimedia Handbook on how to use DRONES
on how to start a professional career with the
use of DRONES, activities and benefits

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THE PROJECT



DRONES Project, funded by Erasmus plus programme, consists of extending and developing the skills and competences of young people (18-30 years old) especially in the field of technology aiming to improve DRONE Technology education through innovative online tools and methods but also experiences with DRONE experts in the partner countries.

As young people are the main users of advanced technology there is a need to increase the awareness of youth and develop their skills in using Unmanned Aerial Vehicles (UAV) such as DRONES, in order to increase their knowledge in media, journalism and their active participation in their societies in general.

Young people are the future leaders and entrepreneurs as youth entrepreneurship and digital transformation is a main priority of the European Union and so there is a need to train them to expand and explore new job opportunities and professions using DRONES or even developing media and DRONE Journalism with innovative initiatives during the project.

The project aims to:

- train young people through the development of:

DRONE Survey for collection of Best practices (R1)

It identifies the best practices in the national countries concerning the use of Drones in education, training, and the collection of other national experiences using Unmanned Aircraft Systems (UAS), in order to improve the participation of young people, in order to identify the existing best practices in their national countries and improvise for further use of unmanned aircraft systems such as Drones.



Multimedia Handbook on how to use DRONES (R2)

It aims to collect open-source materials for a multimedia online handbook usable online and offline, to provide guidelines for institutions, practitioners, educators, young people, journalists to develop and/or implement:

- a) UAV/drone-based educational and training activities,
- b) DRONE based careers in order to implement and develop UAV/drone-based work opportunities, as communication, media and press and practices in their professional careers,
- c) identifying other activities linked with drone communication, media, press, journalism.



DRONE Curricula (R3)

It provides guidelines for young people and interested stakeholders to learn using the DRONES in their lives, to increase their knowledge and abilities in using DRONES for improvisation and innovation in their professional careers. It concerns mainly youth, journalists, bloggers, teachers and other trainers and educators using DRONES for their own needs and professions.



DRONE Incubator (R4):

It gives access to young people who wish to acquire new skills and competences in order to establish and/or improve the use of DRONES in their work environments and professional careers. It facilitates access to training and provide technical assistance for young people (18 – 30 years old), who lack knowledge and skills related to DRONE Technology. It is an interactive tool with videos, certificates and online evaluation



- connect young people with DRONE Experts, journalists, bloggers or other professionals who use DRONES in their professional careers.

The project is composed by an European
partnership composed by:



AEVA
from Portugal
www.aeva.eu



Enoros Consulting
from Cyprus
www.enoros.com.cy



Tatics group srl
from Italy
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A. What to know



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chapter D. Evaluation



Click on the Drones icon to return
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When you find the symbol, you'll find in-depth
online resources to click through

THIS MULTIMEDIA HANDBOOK



As introduced in the previous paragraph, the DRONES project Multimedia Handbook collects open-source materials usable online and offline to provide guidelines for institutions, practitioners, educators, young people, journalists to develop and/or implement:

- UAV/drone-based educational and training activities;
- DRONE based careers in order to implement and develop UAV/drone-based work opportunities, as communication, media and press and practices in their professional careers,
- Identifying other activities linked with drone communication, media, press, journalism.

The Handbook collects existing models and practices carried out by DRONE training providers, professionals and institutions, making interested people able to:

- Assess DRONE skills and competences;
- Identify national and international centres where they train for the use of DRONES;
- DRONE based activities and services;
- Contribute to implement and define the set of skills characterising the professional profiles of drone-UAV based professions;
- Enhance critical thinking skills, ethical and responsible actions and behaviour, as well as emotional intelligence knowledge and capacities.



The Handbook provides guidelines and instructions on how to start a professional career with the use of DRONES, activities and benefits. The Handbook enables trainers, experts and also institutions to dip into the various sections according to their particular needs or if there is a particular issue they wish to focus on using DRONES.

The handbook presents:

- Resources and materials needed for the use of DRONES;
- Intervention with different kind of beneficiaries;
- DRONES skills and values acquired during DRONE Project;
- Evaluation of the interventions and impact;
- Drone-UAV based media, communication, press and journalism professions: cases, success stories (with materials, links), practices and procedures and trainings,
- Examples and step-by-step schemes and testing models;
- Framework of different national practices, trainings, media, press, journalism jobs and other similar professions
- Improved learning and educational models, proposing a new curricula (R3), using them in other educational/ training plans or professions.



The handbook in its multimedia version, is available on the project website: <https://drones-programme.netlify.app/>





CHAPTER A. TO KNOW

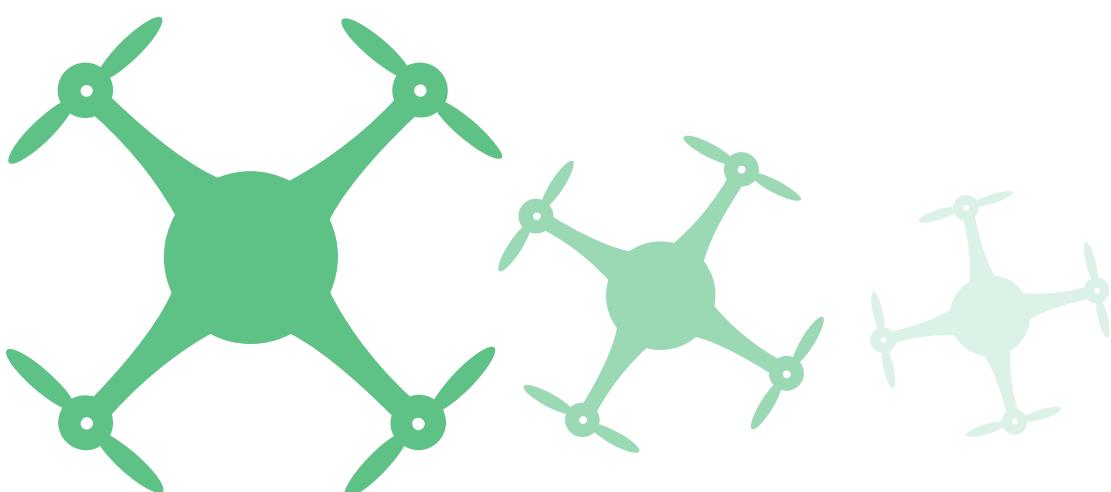
1.1 Drones definition

Drones are defined as Remotely Piloted Aircraft (RPA), Remotely Piloted Vehicle (RPV), Remotely Operated Aircraft (ROA), or Unmanned Aerial Vehicle (UAV) or Unmanned Vehicle System (UVS), also classified as Remotely Piloted Systems (RPAS). They are flying devices which have no pilot on board, piloted by an on-board computer or by a pilot who guides them remotely with a radio control.

However, the fact that they are identified as aircraft (even if remotely piloted) immediately makes it clear that, regardless of the position of the pilot or flight crew, operations must comply with the same rules and procedures as piloted aircraft.

They are "flying objects", available in different variations and versions, that using a small engine have the ability to fly in open spaces and allow to carry out various types of operations, such as taking photographs or transporting small loads.

Drones can be used in different ways, as it will be discussed in the next paragraphs, with different applications depending on their operation and their characteristics





1.2 Drones functioning

Some types of drones are controlled with an app on a tablet, smartphone or computer, while others by a remote control similar to one designed for a video game console. Drones work mainly in two ways:



- **Piloted with radio control that allows the drone to be guided in real time by a pilot unmanned.**

In this case they carry out their task autonomously, after programming the "on-board computer". They are called RPA - Remotely Piloted Aircraft, the most common type are for personal use, of the consumer type.

These are systems equipped with radio control thanks to which the drone is piloted in real time. These drones allow to perform some basic activities such as video shooting from above.

However, these are drones that require a certain level of practice in order to be used in the best way, given that initially it could be complex to fly them and make sure that the air currents do not have a negative impact on the drone itself.



- **Piloted with a remote control via software.**

Called UAV - Unmanned Aerial Vehicle, whose systems cannot be piloted and that will carry out the various operations autonomously during the flight. These must be set prior to their use in such a way that it is possible to exploit the drone according to those particular needs for which it will be "programmed".

For example, to shoot an event, it will be possible to set the flight height, stabilize the drone and choose the different angles before the event and then activate the same settings and let the drone operate autonomously.



1.3 Drones characteristics

Drones are divided into different typologies according to their physical characteristics (hardware), in particular they are classified according to these three distinctions



1. Paddle structure - Multi-rotor drones

These are drones equipped with an engine and blades, which have the purpose of offering a stable flight that can be controlled using the appropriate radio control, which must have frequencies that are not harmful to a person's health. A drone equipped with a rotor blade is called a helicopter if there is only one set of rotor blades. If drones equipped with motor and blades have more than one set of blades, then other types of drones exist: tricopter if there are three, quadricopter in case of four sets of blades, pentacopter if there are five, hexacopter for a drone with six sets of blades and finally an octacopter if the maximum number of blades in the same drone is reached, i.e. eight



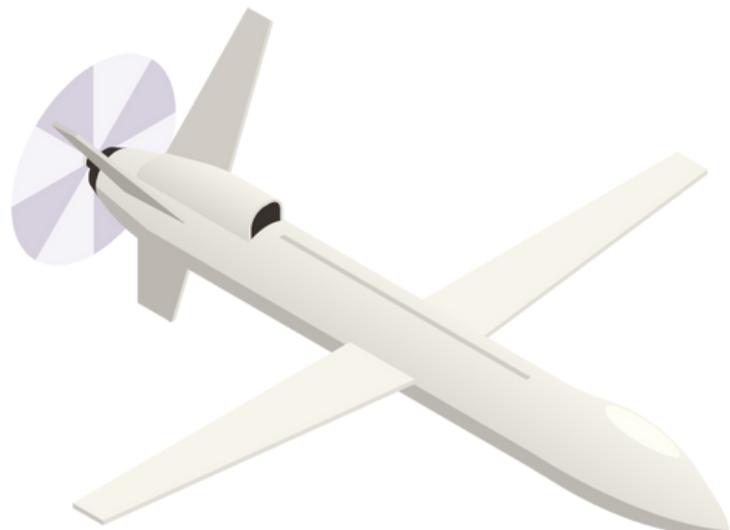
Multi-rotor drones are typically used for shorter flight times and shorter distances to record pictures or to transport light cargo. The most widely used multi-rotor drones have four propellers, which is why they are often called quad-copters. But models with one rotor (helicopter) or with as many as eight rotors (octo-copters) exist as well. Their main advantage is that they take off and land vertically thus do not require much space, and improved controls and software enable automatic stabilization and steering by remote control or autopilot. The trade-off, however, is that flight times are severely shortened, the longer they can fly the more are expensive.



2. Planar structure/ Fixed-wing drones

There are also bladeless drones which are designed to glide: in this case the propellers are absent and are carefully replaced by two large wings.

Fixed-wing drones have a two-wing design, and are typically used to cover longer distances and carry heavier loads. They are often preferred for larger mapping projects or for projects that require the transportation of cargo over longer distances. They can operate in up to 50 km/hour winds and can typically stay in the air between 30 minutes and several hours, depending on the model. Most fixed wing drones fly on autopilot, following predetermined flight paths that are uploaded ahead of the flight. A pilot on the ground merely monitors the flight progress and makes adjustments when necessary. A major drawback of fixed wing drones is that they usually require a strip of open space for landing and take-off. Such spaces may be difficult to find in mountainous, densely forested or densely built environments.



3. Hybrid structure

Finally, there are the hybrid versions, i.e. drones equipped with both systems (motor and wings) but also drones that integrate flight with movement on the ground and which therefore can be used thanks to wheels (these are drones that are used for more professional purposes).

Hybrid drones are relatively new and are equipped with both wings and rotors. This hybrid configuration allows for vertical take-off and landing, and provides the drones with the ability to fly horizontally like fixed-wing drones. This means that they can cover far longer distances and carry heavier cargo than multi-rotor drones. These hybrid drones look promising for cargo delivery where the combination of long flight time and vertical take-off and landing are important features.

They integrate various technological components, from sensors (for example accelerometers, gyroscopes, compass and GPS), to the components of the engines themselves (as ESC systems for rotation speed controller), up to radio receivers, video cameras, robotic arms, etc.



1.4 Drones types



Depending on their functioning, technical characteristics, "extra" equipment (for example robotic arms or drones with cameras) drones can be divided into professional drones (in some cases also called enterprise drones and/or commercial drones) and non-commercial drones (more often identified as consumer drones).

1. Consumer drones, not commercial ones

They are of "common use", i.e. those for the consumer market and are usually used "simply" to take small shots from above (the majority, in fact, are drones with cameras) or as entertainment. In various events, fairs, conferences, they are also used to entertain the public, making people try and guide these small objects, often also challenging each other in some skill competitions.

Non-commercial drones, or consumer drones, are often thought of as little more than an electronic toy.



2. Commercial drones, professional drones

They are more powerful systems than consumer drones and, as the classification itself suggests, are used professionally and/or for commercial purposes.

They are usually larger in size than consumer drones, have more advanced technological features and capabilities, longer battery life, stay airborne longer, and can make longer trips than non-commercial drones.

They can also transport parcels and objects, sometimes even of considerable size and weight, unlike non-commercial drones which, as mentioned, are used more for recreational and entertainment purposes than for professional activities.

Professional drones, for example, are also suitable for holding professional cameras for filming, documentaries, shooting in stadiums and sports arenas or during concerts

3. Drones with cameras

Whether it's consumer drones or professional drones, one of the most common uses of drones involves taking photographs or video footage from above. That's why most of these "flying objects" are drones with cameras.



Depending on the type of drone (consumer or professional) and, of course, the price range, there are drones with different types of built-in cameras/video cameras.

Depending on the needs, therefore, it is good to take into account:

- The type of video camera installed by checking the resolution of the photos and videos it is capable of producing (VGA, HD, Full HD, 4K, etc., exactly as we now do with smartphones);
- The type of camera stabilization (to reduce vibrations and make the image still); professional drones are often equipped with an advanced stabilization system called Gimbal (it keeps the camera still on its axis, so the images are still without smudging or interference from vibration or instability of the drone in flight).
- Among the most advanced camera drones there are also those equipped with the so-called FPV (First Person View) functionality thanks to which drone pilots can see in real time the photos taken by the camera or the video footage made by the camera integrated or loaded on the drone.



4. Mini drones

In the consumer sector the most successful are mini drones, small objects that meet the needs of entertainment or small photo and video shooting of enthusiasts who intend to use drones for non-commercial and professional purposes.

Mini drones, are very small objects, they often fit in the palm of a hand and are built with ultra-lightweight materials. They are not very resistant and tend to break, but they are certainly ideal for learning to fly a drone.

Many models are mini drones with cameras, therefore designed precisely for those who want to try their hand at photos and video footage.

In reality, there are also professional mini drones, as always, everything depends on the technical characteristics, functions and equipment that drones may have.



1.5 Drones Law and Regulation, requirements to get a license and restrictions

Flying a drone without being aware of the dangers could be very risky in any European countries. The adoption of the new European regulation allows the standardization of all country rules.

Before the revision, many little drones were created and sold to the main public whose use was not really controlled depending on the country, and sometimes basic safety rules were not respected.

European Law

Regulation (EU) No 2018/1139 of the European Parliament and of the Council of 4 July on common rules in the field of civil aviation introduces into European Union legislation the basis for harmonised regulation in the field of unmanned aircraft "Unmanned Aircraft Systems" (commonly known as drones, abbreviated to UAS), providing a set of essential rules applicable to the use of this new type of aircraft in Articles 55 to 58 and in Annex IX. Further to the provisions of said Regulation (EU) 2018/1139, Commission Delegated Regulation (EU) 2019/945 of 12 March 2019 on unmanned aircraft and third country operators of unmanned aircraft systems and Commission Implementing Regulation (EU) 2019/947 of May 2019 on rules and procedures for the operation of manned aircraft were published.

The referred regulation was published in the Official Journal of the European Union, on 11 June 2019, being mandatory and directly applicable in all Member States, in accordance with the principle of the primacy of European Union Law.

The new European regulation (COMMISSION IMPLEMENTING REGULATION (EU) 2019/947 of May 2019 on the rules and procedures for the operation of unmanned aircraft http://data.europa.eu/eli/reg_impl/2019/947/oj) is indeed an epochal transition, which transfers a large part of the legislation under the umbrella of EASA (European Union Aviation Safety Agency), harmonizing the regulations on the entire territory of the European Union, and which



introduces significant changes on the duties of those who own and want to use a drone, abolishing the distinction between recreational and professional use, but also expanding the area of operation in low-risk use scenarios. Moreover, facing the massive expansion of drone use during the past few years, and its benefits for job creation and economic growth, the European Union decided to pass a new regulation to better integrate them into the European airspace (European Council, 2021). According to the European Commission, in 20 years, the European drone sector could employ more than 100 000 people and be a great promise.

Uniform European regulations allow the launch in the single market of unmanned aircraft with European conformity markings in order to operate in the categories of operation of UAS provided for in the aforementioned (EU) Regulations.

In addition, mutual recognition among EU Member States of authorisations, certificates, training and theoretical knowledge of remote pilots is guaranteed, thus promoting market access through common rules and procedures, while standardising the level of safety of operations.



CATEGORIES

There are 3 categories of drones:

1. Open category
2. Specific category
3. Certified category

OPEN CATEGORY

The vast majority of recreational uses fall into the new Open category, which includes three sub-categories defined A1, A2 and A3 (part A of the regulation), each with its restrictions on operation and the class of aircraft that can be used, but for which no specific authorization is required to fly your drone. The consequence of this is that for low-risk operations, it will finally be possible to fly drones even in urban



areas, without the constraint of the distance of 150 meters required by current legislation, but always clearly respecting the rules on airspace, which they will continue to be defined and supervised by national bodies.

The Open category is accessible, in particular, if all the following requirements are met (Article 4):

- Maximum take-off mass less than 25 kg;
- Maintenance of the safety distance from people and compliance with the absolute prohibition of overflight of gatherings of people;
- Flight exclusively in direct visibility of the drone (VLOS, visible line of sight);
- Maximum altitude of 120 meters from the surface;
- Prohibition of the transport of dangerous goods.

The new European regulation groups aircraft into classes C0 (<250 grams), C1 (<900 grams), C2 (<4 kg) and C3 (<25 kg). Depending on the class of the aircraft and the Open category there are different obligations and rules.

From class C1 upwards, all drones must also be equipped with a transponder, which transmits data such as the aircraft identification, position and route throughout the flight. Drones placed on the market to be compliant must be equipped with a CE stamp and the symbol of the class they belong to.



In detail, Open flight operations are classified as follows “UAS OPERATIONS IN THE ‘OPEN’ CATEGORY” (part A of the regulation):

- **Category A1, Drones C0 (<250g):** it will be possible to operate the aircraft even by flying over people not involved, but never gatherings, in compliance with the maximum altitude of 120 meters and in optical visibility. If the drone is equipped with follow-me mode, when in use the pilot must keep a maximum distance of 50 metres;
- **Category A1, Drones C1 (<900g):** compared to class C0, a certificate of competence is required for the operator and it is necessary to avoid overflight of uninvolved people. If this happens, the pilot should try to reduce the overflight time as much as possible. Class C1 drones must also be equipped with transponders;



- **Category A2, Drones C2 (<4kg)**: compared to category A1, it will be possible to operate class C2 aircraft while respecting a horizontal safety distance of 30 meters from people not involved. The pilot will be able to reduce the distance up to 5 meters as long as he maintains a maximum speed of 3 meters / s. Speed limited to 3m / s mode is an essential requirement of class C2 drones. Not only is the pilot's certificate of competence mandatory, but it is also required to certify practical training and further theoretical examination on meteorology, drone flight performance and ground risk mitigation measures. In the absence of this second certificate, it will be possible to fly only in category A3;
- **Category A3, Drones C2, C3 and C4 (<25kg)**: additional limitations are introduced compared to A2. It is not allowed to operate the drone in spaces where there are people who are not involved. The horizontal safety distance of 150 meters from "residential, commercial, industrial or recreational areas" must be maintained. And, of course, the pilot must have completed the exam and obtained the certificate of competence.



SPECIFIC CATEGORY

This category is for moderated risk operations. It allows "out of sight" flights as well as flights in some places where they can be potential dangers such as urban areas, close to aerodromes... This is mainly for professional use. Drones are from 25kg or more.

With a technical (UAS with class C5-C6 endorsement), operational and training requirements are needed. It is needed to pass the theoretical and practical trainings to get a certificate.

An Operator's declaration of conformity is needed, so being registered with your NAA and an Operations Manual (Manex).



Starting in 2024, there are two possibilities or “scenarios” to pilot a drone of specific category:

- The first possibility is to follow the European scenario called “STS-01”: it is when a flight is under visual control in a populated or unpopulated area with a drone of class C5.
- The second possibility is to follow the European scenario “STS-02”: it is when a flight is out of sight, but under the control of visual observers in charge of the surveillance of the airspace and at a distance of less than 1 km from the pilot with a drone of class C6.

Until 2026, it is possible flying under national standard scenarios as there is a transition period.

An the authorization to use a drone without following these two European scenarios and still being in the specific category.

There is the SORA or Specific Operations Risk Assessment which evaluates the risks for people and goods on the ground, for risk of impact, and for the risk of the drone slipping from your control.

- There is the PDRA or Pre-Defined Risk Assessment which is like the SORA but for a specific type of operation such as a flight of a standard scenario but without a C5 or C6 drone.
- In case a drone needs to do a lot of operations that cannot be included in the STS, then it is needed to ask for a LUC or a Light UAS Operator Certificate

**CERTIFIED
CATEGORY** This category is for high-risk operations, for people and good's transportation, and for a flight over a gathering of people.



AUTHORISATIONS

The article 21 “Article 21 Adaptation of authorisations, declarations and certificates” foresees that:

1. Authorisations granted to UAS operators, certificates of remote pilot competency and declarations made by UAS operators or equivalent documentation, issued on the basis of national law, would remain valid until 1 July 2021.
2. By 1 July 2021 Member States converted their existing certificates of remote pilot competency and their UAS operator authorisations or declarations, or equivalent



documentation, including those issued until that date, in accordance with this Regulation.

3. Without prejudice to Article 14, UAS operations conducted in the framework of model aircraft clubs and associations were allowed to continue in accordance with relevant national rules and without an authorisation in accordance with Article 16 until 1 July 2022

UAS		Operation		Drone Operator/pilot		
Class	MTOM	Subcategory	Operational restrictions	Drone Operator registration	Remote pilot competence	Remote pilot minimum age
Privately built	< 250 g	A1 (can also fly in subcategory A3)	<ul style="list-style-type: none">- No flying expected over uninvolvled people (if it happens, should be minimised)- no flying over assemblies of people	No, unless camera / sensor on board and a drone is not a toy	- no training needed	No minimum age
Drones without class identification label	< 500 g			Yes	<ul style="list-style-type: none">- read user manual- complete the training and pass the exam defined by your national competent authority	16*
Drones without class identification label	< 2 kg	A2 (can also fly in subcategory A3)	<ul style="list-style-type: none">- no flying over uninvolvled people- keep horizontal distance of 50 m from uninvolvled people (this can be reduced to	Yes	<ul style="list-style-type: none">- read user manual- complete the training and pass the exam defined by your national competent authority	16*
Drones without class identification label or privately built	< 25 kg	A3	<ul style="list-style-type: none">- do not fly near people- fly outside of urban areas (150 m distance)	Yes	<ul style="list-style-type: none">- read user manual- complete the training and pass the exam defined by your national competent authority	16*

Figure 1: the regulations



PROTECTION OF PERSONAL DATA

The focus is on the protection of personal data collected through the drone. Its use is now within everyone's reach: enthusiasts, photographers, web directors, drone-racing sportsmen and many others, use this extraordinary vehicle more or less with the same purposes. For some time also the category of private investigators has been added to this list of users for their own professional purposes.

From a privacy point of view, the law is incomplete, specifying only that "*Considering the risks to privacy and protection of personal data, operators of unmanned aircraft should be registered if they operate an unmanned aircraft which is equipped with a sensor able to capture personal data. However, this should not be the case when the unmanned aircraft is considered to be a toy within the meaning of Directive 2009/48/EC of the European Parliament and of the Council on the safety of toys (3)*".

Considering the speed of the technological innovation, so much could be done in this field where common sense and careful use are therefore recommended.



REGISTRATION

All drones should be registered with the local authorities, except for those labelled as a toy (toy directive 2009/48/EC) or those that weigh less than 250 grams (and do not carry a recording device). Even if in accordance with the European all the countries regulation have been harmonised, more information on the specific countries regulations could be found as follows



Cyprus Regulation

Cyprus introduced regulations controlling the use of drones in 2015, by Ministerial Decree No. 402/2015 (the “Drones Decree”) and Decision No.403/2015 (the “Drones Decision”), both issued pursuant to the provisions of the Civil Aviation Law of 2002, as amended.

Law	Link
General law to fly drones	https://drone-laws.com/drone-laws-in-cyprus/#UAS_Laws_%E2%80%93_General_rules_for_flying_drones_in_Cyprus



French Regulation

The drones' rules in France are regulated by European law, especially for their conception, maintenance, and exploitation of them. However, some national laws stay practical, such as the safety or the use of French airspace.

The French legislation on drones was created in 2014. Needed legislative points and training to pilot drones depend on the category and the use of your drone. The Website of the French Public Service gives all the information about the rights and rules according to the specific drones' categories and conditions. There are a lot of different rules to follow:



Law	Link
DGAC, national aviation agency in France	https://www.ecologie.gouv.fr/direction-generale-aviation-civile-dgac
French Platform from government, “Service Public” to identify what to do with your specific drone in a specific context	https://www.service-public.fr/particuliers/vosdroits/F34630#:~:text=Respecter%20les%20hauteurs%20maximales%20de,proximit%C3%A9%20des%20terrains%20d'aviation
AlphaTango platform to declare your drone and pass your certificate	https://alphatango.aviation-civile.gouv.fr/login.jsp



Italian regulation

The applicability in Italy of the EU Regulations on UAS (drone) 2019/947 and 2019/945 has been delayed from 1 July 2020 to 31 December 2020, due to the COVID-19 crisis with several different cases entering into force.



The Italian legislation in the drone sector, that integrates the EU regulation, could be found in the following table, accessible from the website

<https://www.enac.gov.it/sicurezza-aerea/droni/normativa-droni>

Law	Link
Reference regulation in Italy that integrates European legislation	https://www.enac.gov.it/la-normativa/normativa-enac/regolamenti/regolamenti-ad-hoc/regolamento-uas-it
NI-2021-013 of 23 December 2021 - Pilot certificates for UAS operations and procedures for recognized entities in implementation of Reg. (EU) 2019/947	https://www.enac.gov.it/la-normativa/normativa-enac/note-informative/ni-2021-013
Provision GENDISP-DG-15/07 / 2021-0000061-P - Extension of validity certificates for Critical Operations issued pursuant to the "Remotely Piloted Aircraft" Regulation	https://www.enac.gov.it/la-normativa/normativa-enac/disposizioni/disposizione-gendisp-dg-15072021-0000061-p-estensione-validita-attestati-per-operazioni-critiche
Easy Access Rules for Unmanned Aircraft Systems - This document is an easy-to-read compendium and is only updated periodically. For up-to-date consultation of the documents contained therein, refer to the Regulations, AMC and GM currently valid	https://www.easa.europa.eu/document-library/easy-access-rules/easy-access-rules-unmanned-aircraft-systems-regulation-eu
UAS-IT Regulation - Edition 1 of January 4, 2021	https://www.enac.gov.it/la-normativa/normativa-enac/regolamenti/regolamenti-ad-hoc/regolamento-uas-it https://www.easa.europa.eu/the-agency/faqs/drones-uas
Commission Implementing Regulation (EU) 2019/947 of 24 May 2019	https://eur-lex.europa.eu/legal-content/IT/TXT/?qid=1574417633874&uri=CELEX:32019R0947
LG 2020/001-NAV - Ed.1 of 30 September 2020 - Guidelines for UAS Operations with UA with an operational take-off mass below 25 kg - VLOS and BVLOS scenarios	https://www.enac.gov.it/la-normativa/normativa-enac/linee-guida/lg-2020001-nav





Commission Delegated Regulation (EU) 2019/945 of 12 March 2019	https://www.enac.gov.it/la-normativa/normativa-internazionale/normativa-europea/regolamenti/regolamento-delegato-ue-2019945-della-commissione-del-12-marzo-2019
Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018	https://www.enac.gov.it/la-normativa/normativa-internazionale/normativa-europea/regolamenti/regolamento-ue-20181139-del
LG 2017/001-NAV - Ed.2 of 9 January 2020 - On the risk assessment methodology in RPAS operations for non-geographic authorizations and permits to fly - Application guide	https://www.enac.gov.it/la-normativa/normativa-enac/linee-guida/lg-2017001-nav
ENAC Regulation "Rules of the Air Italy"	https://www.enac.gov.it/la-normativa/normativa-internazionale/normativa-europea/regolamenti/regolamento-ue-20181139-del
ENAC Regulation "Air Traffic Services"	https://www.enac.gov.it/la-normativa/normativa-enac/regolamenti/regolamenti-ad-hoc/regolamento-servizi-di-traffico-aereo
ENAC Circular ATM-09A - Ed.1 of 24 March 2021 - UAS-IT: Implementation criteria and procedures for geographical areas	https://www.enac.gov.it/la-normativa/normativa-enac/circolari/serie-atm/circolare-atm-09a



Maltese Regulation

Malta is covered by the two main regulations issued by the EASA (European Union Aviation Safety Agency) on the use of drones. These are the Commission Delegated Regulation (EU)2019/945 and Commission Implementing Regulation (EU)2019/947.

All Maltese regulations regarding the use of drones can be found on the Transport Malta website.



Law	Link
Drone policies and regulations by Transport Malta	https://www.transport.gov.mt/aviation/regulation-policy/maltese-legislation-703
Complete list of Maltese legislations	https://legislation.mt/
Air Navigation Services and Aerodromes Unit (ANS&AU) Legislations	https://www.transport.gov.mt/aviation/air-navigation-services-aerodromes/atm-ans-adr-legislation-692
Local permissions and regulations	https://www.transport.gov.mt/aviation/flight-permissions-640



Portuguese Regulation

The referred regulation was published in the Official Journal of the European Union, on 11 June 2019, being mandatory and directly applicable in all Member States, in accordance with the principle of the primacy of European Union Law, with direct implications regarding the requirements currently explained in Decree-Law no. 58/2018, of 23 July and ANAC Regulation no. 1093/2016, of 14 December.



ANAC is the authority that regulates civil aviation in Portugal and has drawn up a regulation that sets the rules applicable to the use of unmanned civil aircraft, commonly known as "drones".

Indeed, the rules on the registration of UAS operators will now follow the provisions of Implementing Regulation (EU) 2019/947, and it should also be noted that the ANAC Regulation will only continue to apply, on a transitional basis, to the restrictions and areas set out in the annex to that regulation (the other rules on the operation of UAS will be exclusively governed by European regulations).



Law	Link
ANAC Regulation no. 1093/2016, of 14 December.	https://uas.anac.pt/ .
Regulation (EU) 2018/1139 of the European parliament and of the council of 4 July 2018	https://eur-lex.europa.eu/legal-content/PT/TXT/PDF/?uri=CELEX:32018R1139&from=PT
Commission Delegated Regulation (Eu) 2020/1058 Of 27 April 2020 Amending Delegated Regulation (Eu) 2019/945 as regards the introduction of two new classes of unmanned aircraft systems	https://eur-lex.europa.eu/legal-content/PT/TXT/PDF/?uri=CELEX:32020R1058&qid=165107409250&from=EN
Regulation (EC) No 785/2004 of the European Parliament and of the Council of 21 April 2004 on insurance requirements for air carriers and aircraft operators	https://eur-lex.europa.eu/legal-content/PT/TXT/?uri=celex:32004R0785
Commission Implementing Regulation (EU) 2022/425 of 14 March 2022 amending Implementing Regulation (EU) 2019/947 as regards the postponement of the transition dates for the use of certain unmanned aircraft systems in the 'open' category and the date of application with regard to reference scenarios in operations performed at or beyond the line of sight	https://eur-lex.europa.eu/legal-content/PT/TXT/?uri=CELEX:32022R0425



Slovenian Regulation

On Dec. 31, 2020, a new (EU) regulation in the area of UAS entered into force, replacing the previous Slovenian regulation.

Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on rules and procedures for the operation of unmanned aerial vehicles (hereinafter: Commission Implementing Regulation (EU) 2019/947) and Commission Delegated Regulation (EU) 2019/945 of 12 March 2019 on unmanned aerial systems and operators of unmanned aerial systems in third countries (hereinafter: Commission Delegated Regulation (EU) 2019/945)

All rules for the use of drones are set by the Civil Aviation Agency - CAA <https://wwwcaa.si>.



Law	Link
UAS – Unmanned Aircraft Systems	https://www.easa.europa.eu/regulations
Both regulations are also published in Slovenian in the Official Journal of the EU	https://eur-lex.europa.eu/legal-content/SL / TXT /HTML/?uri=CELEX:32019R0947&from=EN https://eur-lex.europa.eu/legal-content/SL / TXT /HTML/?uri=CELEX:32019R0945&from=EN
Regulation on the Implementation of the UAS Regulation	Regulation on the Implementation of the Commission's Implementing Regulation (EU) on Rules and Procedures for the Management of Unmanned Aircraft (Official Gazette of the Republic of Slovenia No. 195/20)
Geographical restrictions for UAV	"Geographical restrictions for UAV"
Regulation on unmanned aircraft systems (Uredba o sistemih brezpilotnih zrakoplovov)	http://www.pisrs.si/Pis.web/preledPredpisa?id=URED7317
New rules for the use of unmanned aerial vehicles (drones) (Nova pravila za uporabo brezpilotnih zrakoplovov (dronev) – Informacijski pooblaščenec)	https://www.iprs.si/novice/6051f21930cca
Answers To Frequently Asked Questions (Odgovori na pogosto zastavljeni vprašanja - CAA)	https://wwwcaa.si/faq.html
Municipal policing of the use of drones (Izvajanje nadzora občinskih redarstev v zvezi z uporabo brezpilotnih zrakoplovov)	https://skupnostobcin.si/wp-content/uploads/2021/03/droni-zakonodaja-eu-obcinska-redarstva-koncna.pdf
Drone Rules	https://dronerules.eu/sl/recreational

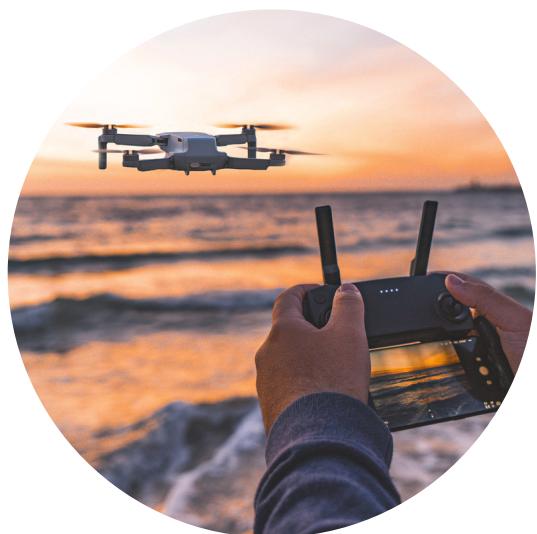




1.6 Basic rules to flight safely

When flying a drone, it is important to respect some basic rules. Regulations are to protect other UAVs and people on the ground.

It is important to understand how much safety and privacy are important in drone regulation.



All these rules were made because when drones were created and progressively used by everyone, there were a lot of accidents. In the beginning, drones were only used by militaries, but the democratisation of their use led to everyday consumption of them, and to the need for basic rules of safety.



The rules are:

1. Do not fly over people

It can be dangerous if you lose control of your drone, and can bother people as most drones do make much noise. It can also be related to privacy respect.

2. Respect the maximum flight height (120 metres high).

However, sometimes, it can be less according to the localisation. There are places where you are forbidden to use your drone. Here are all the places where you cannot fly your drone due to privacy and risk issues:

- Airport
- Heliport
- Aerodromes
- Nuclear power stations,
- Military sites,
- Hospitals,
- Jails,
- Nature reserves,
- Urban areas
- Crash sites or fire (as safety operations can happen at the same time)



3. Never lose sight of your aircraft and do not use it at night.

This rule is a basic rule of safety, as you always have to have an eye on your drone. In certain situations when you cannot see your drone by yourself, then someone else should be able to watch it for you and to communicate with you to warn you in case there is a problem. Night-time is tricky because drones can be lost really easily.

4. Do not fly your aircraft over public areas in built-up areas

This rule's objective is to avoid bothering other people and is also related to privacy, as most drones have cameras on them.

5. Do not fly your aircraft near airfields

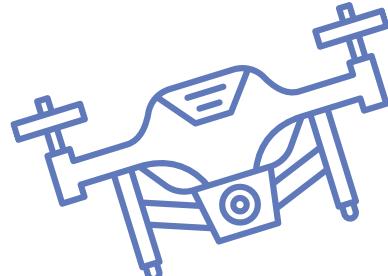
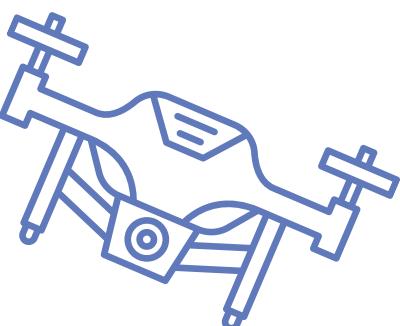
This can be dangerous if you lose control of your drone or you don't pay enough attention, it can create accidents. In airfields, as there are many aircraft, there are rules and procedures to avoid any danger and any accident. In the airspace, you can encounter other people like emergency helicopters or military aircraft. They can fly at low altitudes where you fly your drone. In that case, you need to land your UAV as they have priority. Please, check with your NAA what are the zones where you cannot fly your drone or where you need authorisation before entering them.

6. Do not fly over sensitive or protected sites

This is the same idea as the previous rule, and you can see the basic rule number 2 to know all places where you cannot fly as there are sensitive or protected sites.

7. Respect the privacy of others.

Do not distribute photos or videos without the agreement of the persons concerned, or commercial use of them without any authorisation. This is why you should not fly your drone over people, private or public areas, except if you have an agreement with the person concerned.





8. Check under what conditions you are insured for this activity

In case of doubt, always contact your country's authority. Actually, every situation is different, it depends on the drone you have and the context. Even if there is a European regulation currently set up, it can differ according to the country you are in. Every European country has its own rules and regulations on some aspects and their national authority.



Good to know:

An information leaflet must be provided with the packaging of drones offered for sale, which specifies the rules to be followed for any use of a leisure drone. You must be 16 to pilot a drone and have your certificate. However, certain EASA Member States allow a lower minimum age requirement.



The cross-border procedure:

In case you want to fly your drone in another country than yours, you need to do a cross-border procedure. You can have specific authorisation to fly your drone in another European State. It is called a cross-border procedure. You can fly in another European state only if this country signed the EU947 decree. However, you need to do some research on your national regulation to check if there are some changes from the European rules.



What is this certificate?

You need to do training and pass a test for UAVs of more than 250g or less but equipped with data-registered tools like cameras. The certificate says that you passed the test successfully and is valid for a period defined. After this period of time, you have to pass it again. Don't worry, it is free and you can do it as many times as you need to.



In case you don't respect the rules:

If you fly your drone without your certificate, you will have a fine of 450€ and 38€ if you have passed the test but cannot show your certificate immediately.

If you violate the safety rules and overflight bans, you risk one to six months imprisonment and a fine of €15,000 to €75,000, as well as having your drone confiscated.



1.7 The potential risks and drifts of the drone – how to train your emotional intelligence skills.

Easy to fly, stealthy and capable of carrying loads, drones raise fears of potential malicious use. Inexpensive and easily accessible, drones have become a standard item in all European countries. Recreational drones have experienced a major boom since the 2010s with the arrival of miniaturised, affordable and sufficiently manoeuvrable devices to be accessible to novices. That is the main reason why a new European regulation has been decided and is currently applied.

You've seen the basic rules of safety in the previous part. Now we are going to see why these basic rules are essential, and what the potential risks are. Actually, except for military drones, all can be misused or abused, like any other connected device.

Potential risks:



-> Privacy

Flying your drone over private property and urban areas involves several risks, such as the risk of invasion of privacy or the risk of a drone falling on the population.

Flying over sensitive areas also threatens the safety of people and risks undermining State security.

As drones have a wide range of applications and options, some uses may involve the collection of personal data and give rise to ethical questions or concerns about privacy or personal data protection.

Drones can also be used in the context of operations (whether claimed or not) to discredit the state or certain of its operators by flying over sensitive areas such as nuclear power stations, military bases or airports. Some actions are also carried out over industrial sites, and can be affiliated to economic espionage. It should be borne in mind that some offences are also committed out of ignorance of the applicable regulations without intent to harm, but it is complicated to identify the intention of the remote pilot from the mere sight of the drone over such sensitive sites.





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-> Crash



Drones without evasive devices risk colliding with other aircraft. In the most severe cases, the drone can cause serious damage to an aircraft.

Since the end of 2013, there have been a number of aerial incidents involving drones at airports around the world, resulting in delays and even closures of airports.

-> Data protection



One risk as a drone pilot is that the development of drone technology makes it vulnerable to hackers who can quickly attack the drone's central control system and become the original controller of the drone. The main control system contains important knowledge that is essential for hackers to escape without the knowledge of the original operator. Hackers can access private information, destroy or damage files, and disclose data to unauthorised third parties

-> Nature destruction



Drones are vulnerable to wildlife and sometimes dangerous to nature. When drone operators fly in wildlife-rich areas, they can crash into trees or potentially collide with vulnerable animals.



Large flying birds such as eagles often attack or even capture drones operating in their space for critical data.

In raptors, a drone flying too close to the nest can be identified as a predator that should be hunted or eliminated. Similarly, drones can cause birds to fly away and consequently fail to reproduce if the clutch is abandoned or if they are absent from the nest for too long during the nesting period, threatening the reproduction and survival of some species.

Good to know:

You can take out insurance for your drone to prevent any damages, but it is not mandatory.

The human factor:

What is essential to remember is that, in the majority of situations, the human factor is the reason of the accident. For instance, the emotional load or fatigue of air traffic controllers or national defence air robot operators influences their performance and increases the risk of error. Continuous monitoring of the emotional state and stress of operators would limit mental overload during long shifts and minimise opportunities for critical errors.

When you decide to use your drone, the good condition of your mind and your body is as important as having correct and safe material and respecting the basic rules of safety. Don't use it if you feel too tired or if you don't know if you will be able to control it until the end of your flight.

Now, for certain jobs, there are AI created to measure the emotional intelligence to prevent any accidents or any risk with drones.



More information:

Archambault L., Rotily C., (July 23, 2020), “Drones: usages malveillants, risques d'accident et neutralisation: étude comparée du droit français et du droit allemand”, SELENE Avocats

<https://www.selene-avocats.fr/publications-activites/2549-drones-usages-malveillants-risques-daccident-neutralisation-etude-comparee-droit-francais-droit-allemand/>

Zhenhe, (May 22, 2022), “10 avantages et inconvénients des drones”

<https://zhenhe-co.com/fr/10-principaux-avantages-inconvenients-du-drone/>

Dansereau N., (March 3 , 2021), L'IA détecte l'état émotionnel des opérateurs de drones, CSCience

<https://www.cscience.ca/2021/03/03/ia-detecte-etat-emotionnel-des-operateurs-de-drones/>

CHAPTER B. GET TRAINED



SECTION 1. DRONES AND NEW CARRERS

While experts make predictions that many jobs will become obsolete in the next decade because of the technological revolution, the demand for drone pilots has emerged as a booming area.

As drones are already revolutionizing industries and businesses across a range of sectors, so too is the demand for skilled professionals to operate this equipment.

This is because the work performed with drones is no longer a luxury to become something necessary and that brings many benefits to companies.

In addition to the capture of high-quality images, the work of the drone pilot reduces the time for certain activities, which increases productivity considerably.

Another advantage of this profession is that drones can fly over dangerous places for people and at a good distance from the pilot, decreasing the risk of accidents with workers.

These are just a few advantages, but as the industries that develop drones continue to innovate with more technological equipment to simplify different work sectors, there is no limit to what drones can do in the future.



More information:

<https://uavcoach.com/uav-jobs/#guide-0>

<https://www.questonline.co.uk/careers/career/drones-training>

<https://mundogeo.com/en/2021/09/16/drones-a-simple-tool-or-serious-piloting-skills-required/>

<https://www.thegpstime.com/what-are-the-skills-required-and-job-opportunities-in-drone-segment/>



2.1 Drones and career in Journalism

Until recently, flying drones was seen only as a hobby. Now, however, with these flying vehicles becoming important parts in different segments, the need to categorise this hobby as a profession is only growing and the career of drone pilot has everything to be promising.

In a world where an increasing number of jobs are becoming automated, a career with high growth potential is quite attractive.

So it's no surprise that many people around the world are ditching traditional jobs to work as a professional drone pilot. Are you looking for a job as a drone pilot? Or are you just wondering what kinds of jobs there are in the drone industry?

Drones have become essential business tools in many sectors. This means that a pilot can operate in different areas.

THE FIRST ONE TO ANALYSE IS THE DRONE JOURNALISM!

The development of the internet, smart phones, cheaper smaller cameras, more powerful telephoto lenses, laptop editing systems and the availability of commercial satellite imagery have all contributed to a technological revolution in news-gathering. Drones will add another extremely powerful element to this already impressive list. Drones have considerable advantages for journalists especially on a high risk situations such as wars, civil unrest and natural disasters, in which it could be too dangerous or difficult to have a journalist 'on the ground'. The drone then is extremely beneficial to the safety of journalists, in particular situations. However, even if drones could be considered as a transformative technology, they couldn't change radically the practise of journalism, in terms of influencing editorial decisions or changing storytelling methods. In fact, direct personal contact remains an essential element in elaborating the news with the accuracy in gathering the right information, evaluating the context.



The challenge now for journalists and media organisations is to ensure that the technology is adopted and safety, ethics and privacy are ensured. Still, the role of the human element will remain important for editorial decision, storytelling methodologies and overall mass communication policies.

To be proficient in drones and journalism, then you need to have skills in both drone use and journalism. Moreover the core interest is in “telling stories” with the use of UAS and how to apply them as a storytelling tool.

As for the skills needed to use drones, it is essential to know the regulations and rules in force on the use of drones in journalism, as well as be able to fly the drone safely and accurately. It is also important to know how to choose the most suitable drone for the specific needs of journalism, to know the shooting and video editing techniques, as well as knowing how to process and manage the images and data collected by the drone.

It is important to learn on how photography and video shooting can affect the storytelling, as the new journalist uses images to visually display the facts and help tell the story.

As far as skills in the field of journalism are concerned, it is necessary to have a good knowledge of writing, research and production techniques for journalistic content, as well as having a good knowledge of the language and digital communication techniques.

First of all it is important to know the key steps and practices as basic of journalism to gather, verify and present news, to organise time and resources available, to identify contacts and experts in the sector to gather elements and information on the subject; to use the right questions to obtain information from reliable sources and verifies the accuracy of the answers; to select the information collected, to build an effective story, to create rich narratives, to finally communicate the information (press release, social networks, etc).



The larger newspapers usually have a department that deals exclusively with the management of social profiles, or photographs, or layout. A small publication, on the other hand, can ask its professionals for skills in these areas as well, associating several tasks in a single figure.



The future will require increasingly better skills in the use of Big Data, both to provide a more personalized sharing experience for users, and to investigate and investigate everyday events around the world.

For journalists it has become decidedly more complex to manage the daily mass of information, and at the same time respect the deontological principles of the profession.

Quite obviously among the skills of the present for journalists there are source research also online, the use of all the research and publication tools available on the Internet, knowledge of social networks and the principles of social media management.

Therefore a career in this field has a great potential and it is quite attractive for newcomers.

Types of Missions Drone Pilots Typically Fly in Journalism Work

- Aerial location-establishment shots (i.e., an overview of the location where a news take place)
- Aerial shots
- Aerial shots to establish scope / special perspective for news gathering
- Aerial stock footage for videos of news
- Aerial location-establishment shots of high risk locations (wars, environment disasters, ecc)



2.2 Drones and careers in successful sectors



The first possibility in careers development allowing to valorise the use of drones was presented in the previous paragraph, consisting in drone journalism. However, it is possible to become an entrepreneur in the field or to find drone pilot jobs in the formal market and in the following paragraph it will be presented. Here are the main possibilities:



1. Filming and photography:

One of the most popular applications is photography and filming used for TV projects, cinema, video production companies, etc. Drones are much cheaper than renting a helicopter per hour and can capture images in small, urban spaces or even in remote places.

This is an area of specialisation that requires a lot of experience because, besides the ability to fly the drone, it is necessary to have knowledge of photo and video techniques.

The advantage of this area is that you can work in different ways: filming for news companies, capturing aerial clips for a film or making your own images and selling them.



Types of Missions Drone Pilots Typically Fly in Film Work

- Aerial location-establishment shots (i.e., an overview of the location where a scene takes place)
- Aerial wildlife/wilderness shots
- Aerial footage for chase scenes, fight scenes, and other action sequences
- Aerial shots to establish scope / special perspective for a scene
- Aerial stock footage



More information

<https://uavcoach.com/DFGMasterclass>



2. Agriculture

Technological advances are reaching the rural environment, proof of this is the use of drones in the field. Drones have great potential to easily collect data on crops. Be it to survey hectares, check where the cattle are, air humidity, diseases, storm damage or other useful functions.



Types of Missions Drone Pilots Typically Fly in Agriculture Work

- NDVI mapping to monitor the condition of diverse crops in a farmer's land
- Producing orthomosaic and other types of maps to monitor field turf management
- Utilizing data from drones to perform research on the health of different plants in diverse environments
- Making maps of the drainage and floodplains to determine where water will run off and where pesticides may be redirected by the land's natural topography.



More information

<https://www.dronedeploy.com/resources/ebooks/drones-in-agriculture-puuting-uav-to-work-on-farm>
<http://www.precisionagvision.com/>



2. Public Safety

Traditional means of surveillance leave something to be desired in some requirements and drones fulfil this role well. The drone pilot can work in surveillance companies and private security capturing aerial images accurately and in real time.

This work is very useful to protect an industrial area, university campus, rural area, among other properties that may face threat.



- Types of Missions Drone Pilots Typically Fly in Public Safety Work
- Mapping of crime scenes
- Rescue and search
- Traffic control and accident investigation
- Situational awareness in real time when dealing with explosives and dangerous materials
- Assessing damage following a tragedy
- Urgent delivery services
- Preparing for a fire
- Making instructional materials



More information:

<https://uavcoach.com/drones-fire-departments/>

<https://uavcoach.com/police-drones/>

<https://uavcoach.com/lafd-drone-program/>



4. Education

Drones are being employed in the classroom, from elementary, to middle, to high schools, as well as in community and four year degree universities.

Working with drones in education could mean that you're a teacher who incorporates drones into classroom activities to help kids become enthused about STEM subjects, or it could mean that you're teaching people how to fly and perform other things related to UAVs.

It might also imply that you establish a drone club at your school to encourage students to become enthusiastic about both flying and the science that underlies drones.



More information:

https://www.dronepilotgroundschool.com/scholarship/?_ga=2.201154793.698387734.1678460705-1234800112.1678460705#highschool



5. Telecommunications

Drone pilots are changing the way inspections are done in the telecommunications industry by conducting tower surveys and inspections in a fraction of the time required to send a person up a tower, making the process both cheaper and safer for those involved.



AT&T began using drones for cell tower inspections a while ago, and telecommunication company Verizon sees so much potential in the drone industry that they purchased drone company Skyward in 2017.

Knowing what to look for when doing these tower inspections and surveys is key for this kind of work.

In general, when doing these kinds of inspections drone pilots are looking for environmental or other hazards before climbing (bee, birds, structural damage, etc.); identifying damaged areas; or investigating the structure's integrity before personnel climb the tower to find out if it's safe to climb at all.

Types of Missions Drone Pilots Typically Fly in Telecommunications Work

- Inspections of cell towers to check for broken machinery, tower damage, or wildlife living inside the tower (i.e., posing a risk to itself or to maintenance members climbing the tower)
- Inspections of radio towers—For the same reasons
- Inspections of transmission towers—For the same reasons
- Inspections of monopole telecom towers—For the same reasons
- For the same goals, other tower kinds.



More information:

https://www.dronepilotgroundschool.com/tower-surveying/?_ga=2.142429045.698387734.1678460705-1234800112.1678460705



SECTION 2. LEARNING NEEDS

2.3 Learning objectives in using a drone

Unmanned aircraft pilots (UAP) operate unmanned aerial vehicles for a variety of purposes. They need to have specific skills to operate the drone as well as to navigate and control the camera. So, below are the learning objectives for any individual willing to operate a Drone.

- To identify the different pieces of the aircraft and be able to describe its capabilities, limitations and respective software
- To manage and assemble the different pieces and/or tools/resources.
- To relate and perform calibration and system settings
- To name the procedures of using drones properly
- To handle the aircraft properly and understand its procedures
- To list the law governing the operation of drones
- To recognize suitable weather conditions to use the aircraft
- To show resilience and patience
- To reveal strictness and persistence
- To be able to communicate accurately for an efficient drone operation
- To be careful and focused when using the drone
- To be able to remain calm under pressure
- To be able to take quick decisions in emergencies
- To be able to give accurate instructions and accept considerable responsibility
- To respect people on the ground regarding privacy and do not create situations of physical danger both on the ground and in the air
- To reveal resilience
- To accept responsibility for accidents occurring from driving the drone

Learning objectives



So, Drone pilots must have a very good understanding of the technical and practical aspects of flying a drone. It is very relevant to have communication skills and communicate effectively when flying a drone for efficient operation. Only then, they can take pictures and make videos using DRONES correctly. Great interest in aviation, good concentration skills, ability to stay calm under pressure, IT and Math skills, ability to make quick decisions in emergency situations, give accurate instructions and accept considerable responsibility in managing and using the drone as well as a very good command of its pre, during and post production software is very important in anyone willing to work with Drones. Last but not least, all parties interested in using Drones should be aware of the respective local laws that are usually covered in the courses available to complete the A1/A3 and A2 license.

The following are the basic skills drone pilots should have:



Spatial Awareness

Understanding your environment and how objects connect to one another is known as spatial awareness. This ability can assist you in successfully piloting a drone through a variety of situations, such as cities or forests. It also enables you to spot potential barriers in the way of the drone's intended path.



Quick Thinking

Decision-making in a timely and efficient manner requires fast thinking. When unforeseen circumstances develop, you might need to use your quick thinking skills as a drone pilot.

Data Analysis

The capacity to interpret and comprehend data is known as data analysis. Drone pilots may find use for this talent as they frequently utilize information from their flight logs to decide where to fly next or how to get better at flying.



Attention to Detail

A talent that can help drone operators guarantee they operate their drones safely and successfully is attention to detail. For instance, it's crucial for a pilot to be able to follow directions exactly when operating a drone for work to prevent interference with other equipment or property damage. In order to prevent mishaps, it's crucial for a pilot to pay close attention to factors like weather patterns, flight trajectories, and safety measures.

Flight Planning

Making a flight plan for your drone is the process of flight planning. This entails choosing a suitable place, figuring out how to maneuver securely, and seeing any potential impediments that might get in the way of your flight.

Drone pilots need problem-solving abilities to ensure they can recognize and address potential issues that may develop during flight. While deciding how to react to unforeseen circumstances like weather conditions or technical issues, pilots apply problem-solving techniques.

Problem Solving Skills



Being flexible is having the capacity to change course when necessary. If weather conditions have an impact on your initial goals, you as a drone pilot may need to modify your flight plan or switch places.

Flexibility

Drone operators must have a solid understanding of weather patterns because it can compromise the security of their flights. Weather trends should be understood by drone pilots so that they can make appropriate flying preparations.

Weather Patterns



The capacity to use your hands and eyes simultaneously is known as hand-eye coordination. The ability to manage remote controls and keep an eye on where their drones are heading is crucial for drone pilots.

Hand-Eye Coordination



Regulations for airspace control the altitude at which and the location of drones. To fly a drone safely, it's crucial to understand the rules of airspace.

Airspace Regulations



The practice of changing video material to tell a coherent story is known as video editing. The ability to trim sequences or merge many clips into one film can be valuable for drone operators who record and edit their own footage.

Video Editing



GPS Navigation

The safety of a drone pilot's flight depends on their ability to navigate. A pilot can track their whereabouts using GPS navigation to avoid flying over people or in prohibited airspace. In the event that they lose contact with their drone, it also aids in their return to the same location.



Radio Communications

The ability to send and receive messages over a radio system is known as radio communication. Drone pilots may find this ability beneficial since it enables them to speak with other passengers or members of their team while they are in the air.

Aerial Photography

Aerial photography is a crucial talent for drone pilots to have. This entails employing a camera and taking photographs from the air, requiring expertise in camera operation and drone navigation.



Pilot Certification

For use by corporations or individuals, drone operators must be certified as drone pilots. You should review the laws of your nation.

Drone Maintenance

Drone operators should be familiar with drone maintenance and repair. This is crucial because it guarantees the security of those using drones both in the air and on the ground. Also, it's critical to make sure that your drone can operate properly, which is crucial for effectively accomplishing jobs.



2.4 Learning objectives in being a drone journalist

Learning objectives

- To understand the different Journalism techniques
- To understand the evolution of Modern Journalism

- To recognise the news skills required
- To comprehend the basic of storytelling and how to make an interesting story
- To understand how drones are transforming the journalism industry
- To recognise the different aerial techniques
- To recognise the Post-production and video editing using footage taken with drones.
- To understand how to apply individual emphasis areas, whether that be in communication, journalism or other fields with an overview produced by use of drones (UAS).
- To understand how to connect the interest in “telling stories” with the use of UAS and how to apply them as a storytelling tool.
- To understand how to link communications such as journalism, public relations, film, advertising and advocacy public-service, with in-depth concepts of airborne videography and photography and maneuvering techniques.
- To identify the different visual workflow of journalistic pieces.
- To list the different pieces of the aircraft, its capabilities and limitations and respective software.



The following are the basic skills drone pilots should have:

- Writing unique and original articles, surveys and reports
- Research and select appropriate images to accompany articles
- Carry out editorial duties - selecting articles, reviewing titles, content, style, layout, etc.
- Publish articles and content in print (newspapers) or digitally (websites, blogs and social media)

Realize journalistic services for television and radio broadcasters



A journalist should uses the Five W basic rules, organise time and resources available:

- Identifying contacts and experts in the sector to gather elements and information on the subject matter of the service;
- Making Interviews: the journalist uses questions to obtain information from reliable sources and verifies the accuracy of the answers;
- Define an outline/schedule of the service that is planned to be carried out to define which information to search for (e.g. interview outline).
- Interact with other professional figures to be supported in some phases (e.g. by the photographer, the filmmaker, the sound engineer...)
- Searching for official documents

The journalist verifies the accuracy of the collected information against reliable sources and official documents, making source research also online

Fact-checking

Direct observation

The journalist directly observes events and places to describe them and provide an account of the facts

The journalist involves the public in the collection and presentation of news, through methods such as citizen journalism, social media and open questions

Participatory journalism

Communicate the information

The journalist prepare press releases, informing journalists of events and news relating to the organization and continuously fueling their interest organize and participate in press conferences, check the media coverage of the institution and promote its image, resolve potentially harmful situations for the organization from a communicative point of view.

**Updated on
the new
frontiers of
journalism**

- Data-Driven Journalism: Data-driven journalism uses data analytics techniques to tell stories and uncover new information.
- Immersive Journalism: Immersive journalism uses virtual and augmented reality to create engaging and immersive experiences for audiences.
- Participatory Journalism: Participatory journalism involves the public in the creation and gathering of news, creating a dialogue between journalists and the public.
- Investigative journalism: Investigative journalism uses investigative methods to uncover and report stories of corruption, abuse of power, and other public interest issues.
- Robot journalism: Robot journalism uses artificial intelligence and machine learning to collect and analyze data, and generate news stories and articles.
- Visual Journalism: Visual journalism uses images and videos to tell stories and inform audiences, leveraging



A journalist as first thing should identify the subject of your story and understand what are the key information to communicate to the audience. Then a basic idea for the story is developed, which will help keep you focused on the main topic, with a strong introduction to grab audience's attention and provide a general overview of the subject of the story. Then a storyline is created which is the heart of your story and should present the main facts, characters and places. A climax should be created as the high point of the story and should present the most important or emotional moment

**Storytelling:
writing
unique and
original
articles**

The journalist should know the importance of the

Visual journalism uses images and videos to tell stories and inform audiences, leveraging. Therefore it is important how the videos/photos are shoted:

Panoramas, Dive Flights, Circle Flights, Reverse Flight, Low-altitude flights, Timelapse Flights, Night flights

**Different
video/picture
shooting**



**Post-
production
and video
editing using
footage
taken with
drones**

Basic of File import, Content Selection, Editing, add effects, subtitles and voiceover





SECTION 3.

SKILLS ACQUISITION

3.5 Drone curriculum



LEARNING MODULES

MODULE 1:

Drone-Based Journalism

Unit 1: Basic in journalism

Unit 2: Storytelling

Unit 3: Journalism for images and videos

MODULE 2:

Rules and Regulations

Unit 1: European regulation

Unit 2: Basic rules to flight Safely

Unit 3: The categories of drone

MODULE 5:

Pilot Reportage

It provides guidelines for young people and interested stakeholders to learn using the DRONES in their lives, to increase their knowledge and abilities in using DRONES for improvisation and innovation in their professional careers. It concerns mainly youth, journalists, bloggers, teachers and other trainers and educators using DRONES for their own needs and professions

MODULE 3:

Skills and Career

Unit 1: Introduction: drones in journalism

Unit 2: Entrepreneurship

Unit 3: Good practices

MODULE 4:

technical laboratory and flight workshop

Unit 1: Drone components

Unit 2: Drone Controller

Unit 3: Flying a drone – practical exercises



For more information, please access, creating a login to the project incubator at the website: <https://drones-programme.web.app/>



3.6 Training centres at national context

Please check in this paragraph the training centres available in the different European countries offering training courses in the field:



In Cyprus

From 31/12/2020 all remotely piloted and autonomous aircraft (drones) from the small consumer devices used for recreation, to large aircraft used for other purposes, are subject to the provisions of legislation by EASA, which aims to the safety of flights within the Cyprus Airspace and the European Union.

You have to study all Lessons to gain a good knowledge regarding the new drone regulations by EASA, drone operations and their effect on privacy & data protection, how a drone functions, what to do in emergency situations and many more.

When you finish the online training you can proceed to take the Online Examination. The examination is comprised of 40 multiple choice questions and the pass mark is 75%. You have 3 tries in total. For register for the the online training and exam you have to pay the required fee which is €15 in total.

Once you pass your exam, you will receive you remote pilot Certificate. Its validity will be 5 years. You must have your Remote Pilot Certificate in your possession whenever you plan to perform drone operations and present it when asked by the authorities. You must re-take the online exam when the certificate expires.

Another option in Cyprus to take the licence for Drones is the PS Drone Academy with more than 4 years of active presence in training drone pilots in Cyprus, has gained the trust of Governmental Departments, Universities and Private Corporations. The course syllabus covers the demands of a high level drone operator whose diplomas were recognized by numerous EU CAAs. Using the essence of technology and training, educates pilots who can not only “pilot” a drone, but can operate it in all possible conditions, operate calmly in every scenario and take advantage of all the UAV functions.





The highly experienced instructors they will guide you to become a drone pilot who applies safety principles while you fly your drone. This organization offer courses both to individuals for recreational and professional use and to drone businesses.

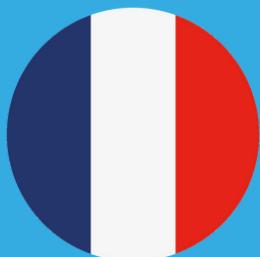
The new regulations which became effective on the 1st of January 2021 requires that you must have an Unmanned Aerial System (UAS) pilot certificate in order to fly your drone legally in Cyprus and Europe.



More information:

http://www.mcw.gov.cy/mtcw/mtcw.nsf/mtcw02e_en/mtcw02e_en

<http://drones.gov.cy/>



In France

In France, there is one official training if you want to have a certificate to use a drone. It is called Alpha Tango and it is created by the civil aviation authority of France. It consists of several modules with short lessons in videos explaining the basic rules and why there are important, with examples and illustrated situations.

At the end of each module, you have to pass a short test with multiple-choice questions.

More specifically, according to the category:

-> **To fly in the Open category, sub-categories A1 and A3**, you must follow the free online training A1/A3 on AlphaTango, then take and pass the online exam to validate this training

-> **To fly in the Open category, sub-category A2**, you must follow the A2 training, validate it by an exam in the centre, and complete it by self-training

-> **To fly in the Specific category**, you must pass an examination comprising 60 questions, with the aim of obtaining a "Certificat d'aptitude théorique de télépilote" (CATT), in an examination centre. You must also follow a practical training course with a training organisation.





The certificate is valid for 5 years; you can take it as many times as desired. The remote pilot aptitude certificate (BAPD) is a provision allowing pilots qualified for particular activities to obtain a certificate allowing them to fly in sub-categories A1, A2 and A3. But beware: you must have been qualified before 1 January 2022 to obtain the equivalence. Some military aviation qualifications may be eligible for equivalence.



More information:

StudioSPORT, (2023), « Dans quelle mesure est-il interdit de piloter un drone en France ? »,

<https://www.studiosport.fr/guides/drones/le-drone-est-il-interdit.html>



In Italy

The necessary training courses and licenses depend on the use you want to make of the drone. If you intend to use the drone for professional purposes, some licenses are required, such as the APR pilot certificate to fly an aircraft for non-recreational purposes.

In Italy there are several drone flight schools that

offer theoretical and practical training courses for the use of drones. One of these is the **Italian Civil Aviation Authority (ENAC)**, which offers training courses to become a drone pilot and provide the Open A1/A3 license.

In general, the cost of the basic course for flying multirotor drones of less than 4 kg usually ranges from 700 to 1,200 euros and is taught by schools authorized by ENAC.



In addition there are other schools, **authorized by the National Civil Aviation Authority (ENAC)**, which is the Italian body in charge of regulating the use of drones. One of the schools authorized by ENAC is the Italian Red Cross, which inaugurated the National Training Center for SAPR (Remotely Piloted Aircraft Systems) with the aim of standardizing training for all CRI personnel.



There are also airfields for airplanes, helicopters and small radio-controlled drones in Italy and of the various clubs that manage them. In these structures you can meet expert model makers with whom you can share experiences and exchange information to improve. However, it is important to know that there are also established no fly zones. This is why it is always important to refer to the official information from ENAC to learn about the rules and limitations on the use of drones in Italy.



More information:

<https://www.enac.gov.it/sicurezza-aerea/droni/come-si-diventa-pilota-uas-drone-open-a1a3>

<https://www.insic.it/privacy-e-sicurezza/privacy-e-gdpr/normative-e-regolamentazione-droni/>

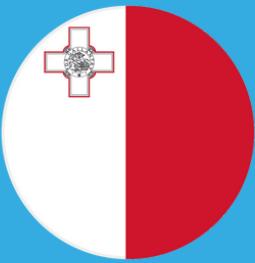
<https://www.ripreseaeeredrone.it/corsi-per-drone-scuola-operatorapr/>
(list of all training centers in Italy. Search for the best drone school according to your needs.)

<https://www.ilmiodrone.it/scuole-volo-enac-corsi-droni/> (provides information on flight schools authorized by ENAC for courses on drones)

<https://droni.ita.zone/index.php/approfondimenti/enac/140-fly-zone-sul-territorio-italiano>

(list of airfields drones in Italy and of the various clubs that manage them).





In Malta

The two main regulations on drones in Malta are the Commission Delegated Regulation (EU)2019/945 and Commission Implementing Regulation (EU)2019/947. Drones are separated in different categories depending on their size and intended use. Different flight authorisation will be required depending on the flight category:



A1:

fly over people but not over assemblies of people;

A2:

fly close to people;

A3:

fly far from people.

To obtain a drone pilot license in Malta one must sit for the exam issued by Transport Malta. The theoretical test required varies depending on the type of drone category. Transport Malta provides all the necessary material and training that is needed to pass these tests however other certified institutions such as Malta Drone Centre offer both practical as well as theoretical courses for those who want to improve their skill as well as work professionally using a drone.



More information:

Transport Malta

<https://www.transport.gov.mt/aviation/drones/training-4446>

Malta Drone Centre

<https://maltadronecentre.com/>



In Portugal

The theoretical knowledge in the different subcategories is provided by the competent authority of a Member State, this being done remotely for subcategory A1/A3 and in person for subcategory A2.

The skill tests in the different subcategories are performed by the competent authority of a Member

State, these being conducted remotely in the case of subcategory A1/A3 and in person in the case of subcategory A2.

Remote pilots must obtain a minimum pass mark of 75% in the examination. The certificate shall be issued only when the requirements of the relevant subcategory competence are met.

Certificates are mutually recognised and the operator may operate in the same subcategory in any other country of the Union. National remote pilots may obtain proofs of completion and certificates of competency issued by other Member States of the Union. Such remote pilots will not need to apply for reconversion of those certificates to the ANAC.

The training will be provided exclusively and directly by the ANAC to the remote pilots, through an electronic platform accessible through <https://rp.anac.pt>, including online/distance training managed by the applicant himself. The exams will be conducted in the platform itself and the candidates must pay attention to the following:

- The A1-A3 exam is taken remotely/online immediately after the course.
- The A2 and STS exams are done in person at ANAC, the candidate should read the guidelines published in the platform in order to propose to take the exam in person.

The proof of completion and the certificate of competency issued by ANAC are valid for 5 years and the renewal has to be done according to the rules of the respective subcategories. After 5 years, if the renewal is not done, the proof of completion loses its validity. The certificates of competency issued may be modified, suspended, subject to limitation or revoked.

The courses to ensure the theoretical competence of the remote pilots and the execution of the exams to check this theoretical competence in the open category in Portugal shall be ensured exclusively by ANAC.





There is no organization in Portugal that is qualified to minister those courses and issue the certificates of competency. Remote pilots may attend preparation courses provided by companies offering training services, but these are not recognised nor do they enable the issuance of an A1-A3 or A2 certificate of competency in the open category (and theoretical component of the STS declarative standard operating scenarios). The ANAC training and examination is sufficient for the remote pilot to obtain the theoretical competence and related proof of completion or certificate of competency recognised by all other EU Member States.



More information:

https://www.anac.pt/vPT/Generico/drones/categoria_aberta/for_macao_examens_certificados/Paginas/Formacao_ExameseCertificados.aspx





In Slovenia

There are three different organisations offering training in the country:

1. Civil Aviation Agency of the Republic of Slovenia (CAA)

Provides training in the use of drones and issues certificates on its website according to the following procedure:

- All drone operators must register (European law requires the owner of a drone weighing more than 250 grammes to do so, as well as anyone whose drone contains sensors that collect personal data).
- Once registered, candidates sign up for online training and an exam.
- For exams, candidates need a qualified digital certificate.
- Minors can also register with the support of their legal guardians.
- Flight courses are not organised.

There is a fee for registration and online training.

All information can be found at <https://www.caa.si/usposabljanje-a2.html> and <https://www.caa.si/registracija-in-usposabljanje-a1a3.html>.

2. Association Quadcopter

Provides individualised assistance with registration and preparation for the CAA exam.

All information can be found at <https://quadcopter.si/storitve/>

3. Company Onedrone

They provide a training centre where UAU operators are trained for open and special categories.

Theoretical and practical training in drone flight rules for beginners, basics of UAU flight, long-range pilot training for category A2, and aerial photography and filming with DJI drones are offered.

For the latter, no own equipment is required, as the course is focused on filming and not on operating the drone.



Maggiori informazioni:

<https://onedrone.si/izobrazevanja/>



3.7 Drones opportunities: Best Practices of new entrepreneurship with drones

As we could already see drones are changing many industries. Here are some best practices that have already been implemented in some EU countries, which could be seen as inspiration to build a new career by using drones.

CYPRUS

Name of the Good Practice and/or success story:

Coronavirus: police watched from the skies to enforce Easter lockdown

Description: Helicopters and drones used by police to check movement regulations over the Easter weekend as part of measures to stop the spread of coronavirus.

Objectives: To prevent the spread of the virus

Target Group: The entire community



FRANCE

Name of the Good Practice and/or success story:

Cultural preservation

Description: An organisation establishes archives of images taken from the interior of several monuments to preserve the images. This initiative follows the fire at Notre Dame de Paris.

Objectives: Preserving cultural heritage in case of any accident.

Target group: Tourism



ITALY

Name of the Good Practice and/or success story: HandiDrone

Description: It is a successful example of the application of the drones' technology for social inclusion, made by a collaboration between a digital agency and a French association for the social and professional involvement of people with disabilities. The first test of the drones' use took place in June 2016.

Objectives: To allow people with reduced mobility and other problems of disability to experiment the use of drones, giving them the opportunity to start a new career, helping them to become drone pilots.

Target group: people with disabilities



MALTA



Name of the Good Practice and/or success story:

Filming and geographical mapping

Description: One of the people interviewed, Luke, is a fulltime videographer who also use drones for filming. Apart from filming using a normal grounded camera ,he uses drones for areal filming as well as for geographical mapping including that of Malta's rocky landscape and cliff edges. If not done by a drone such job would require the use of a helicopter or glider which would be much more time consuming and expensive.

Objectives: Geographical mapping, creating awareness of the country's natural landscape

Target Group: Students, and people interested in geography



PORTUGAL



Name of the Good Practice and/or success story:

Aerial image capture in the implementation of awareness or social actions.

Description: Capture of aerial images in the realization of awareness actions or social content, particularly in raising awareness for children suffering from oncological diseases, autism, etc.;

Objectives: To draw the community's attention to these causes, using impactful images;

Target group: The entire community



SLOVENIA



Name of the Good Practice and/or success story:

Agroforestry

Description: A young Slovenian farmer uses drones to inspect and plan plots of land for clients for whom he creates so-called forest gardens.

Objectives: The goal is to get to know the area as well as possible from the air in order to plan better.

Target group: Subscribers who want to design their land





3.8 Drones opportunities: jobs search

To work in the drone industry, you don't necessarily need to be a drone pilot. More jobs in a wide range of areas are becoming available as the industry develops. This section contains links to job listings from some of the largest drone-related organizations, where you may discover positions that don't necessarily require piloting experience. These positions range from software engineering to marketing to account management to finance and more.

Here's the list:

- **AgEagle** sells software that enables the use of drones in agriculture. They have a single-minded focus on agriculture and seek to assist farmers in raising yields, maximizing profits, and minimizing their environmental impact. Developing data processing software to evaluate photographs of agriculture taken by drones is their primary business.

- By transforming the airspace below 500 feet, **AirMap's** cutting-edge technology gives the drone industry access to precise, trustworthy, and low-altitude navigational data and communication tools. Geospatial, aviation, and policy professionals created their software. Leading companies in the sector, including DJI, Intel, senseFly, and others, partner with AirMap to share their data in the flying applications those businesses offer





ContextCapture, developed by **Bentley**, enables users to easily and quickly provide context for design, construction, and operations decisions for all kinds of infrastructure projects around the world. It does this by enabling users to create large and difficult 3D models that incorporate complex real-world conditions, including scales as large as entire cities, from straightforward photographs or point clouds.

One of the leading producers of consumer drones worldwide is **DJI**. For many new drone service companies, the Phantom 4 Pro is the preferred drone. The Mavic and Phantom series drones from DJI are among the most often acquired in the United States for commercial use, according to data released by the FAA

With the help of the service **DroneBase**, you can either hire a drone pilot to finish a project or sign up as a contractor to fly for them. Based on the location, availability, and equipment needed, they match each project with the appropriate pilot.

Powerful cloud-based drone software that works with any drone is available from **DroneDeploy**. You may map, make 3D models, analyze the data, and share it all directly from your mobile

As we can see there is a huge range of possibilities to work with DRONES. It is an evolving industry and that over the coming years will become more and more common to use in our daily lives. We just need to make an investment in training and in the best tools to use, to be successful in the world of drones



More info:

<https://climbtheladder.com/drone-pilot-skills/>

<https://uavcoach.com/uav-jobs/#guide-7>

[https://viacarreira.com/piloto-de-drones/#Piloto de drones a profissão no futuro](https://viacarreira.com/piloto-de-drones/#Piloto_de_drones_a_profissao_no_futuro)





CHAPTER C. PRACTICE

This part will provide you with examples and step-by-step schemes and testing models of drones resources and materials needed for the use of DRONES



3.1

How to choose a drone

As mentioned in the previous paragraphs, the differences between drones are many and it is not enough to distinguish between consumer drones and professional drones. To choose a drone it is necessary to take into account their characteristics, techniques, functioning but also of construction (for example the materials with which they were built). To understand how to choose a drone, there are some important factors to consider when choosing a drone:



Purpose:

first, you need to decide why you need a drone. Do you want the drone for photography and videography, for fun, or perhaps for professional purposes such as real estate photography, surveying, or searching for missing persons? Depending on the purpose, you decide what functions and features you want the drone to have.

Flight length:

varies between different models. It is important to consider how long you want the flights to last. Drones that can fly longer have larger batteries and are therefore heavier.

Size and weight:

drones come in different sizes and weights, from small drones that fit in the palm of your hand to large professional drones that weigh several kilogrammes. More size and weight usually mean more power for the drone. However, small drones have the advantage of being easier to handle and carry.

Range and stability

important consideration is signal range, which is the maximum distance between the controller and the drone. The stability of the drone is also important, as it affects the quality of the photos or videos.

The camera:

if you want to take photos or videos with a drone, the quality of the camera is crucial. Important features of the camera are the resolution, stabilisation functions, data rate and memory size.



Price

is an important factor when choosing a drone. The price range of drones goes from a few dozen dollars to a few thousand dollars. Make sure you find the best possible balance between the price and your needs.

Regarding the best tools, there are various types of drones and software that we can use to elevate our work, but not all of them are suitable for different professional fields.



Here is a list of the best drones and software according to the job:



Filming and photography

More and more people are using drones in the film industry. Drones come in a wide range of varieties, each with specific advantages for filmmaking.

When ultra high-end cameras are required, the DJI Inspire 2, DJI Phantom 4 Pro V2.0, Mavic 3, and FreeFly Alta are some of the best drones for filming.

These drones have excellent stability and control, cutting-edge filming capabilities, and strong performance in a variety of environments.

Software choices abound for UAV pilots who want to operate in the motion picture sector.

Adobe After Effects, Adobe's Final Cut Pro, Adobe's Premiere Pro, and DroneDeploy are a few software programs that are suggested for UAV operators.

These tools offer cutting-edge editing and post-processing functions, as well as advanced mapping and image processing capabilities, for footage captured by drones.

Many of these software products also provide useful tutorials and other resources that can assist you in learning the abilities required to be successful in this industry.



Agriculture

There are several possibilities accessible to you if you want to work as a drone pilot in the agriculture industry.

The Agras T30, DJI Phantom 4 RTK, DJI Mavic 2, Autel

Robotics X-Star, Yuneec Typhoon H, and Parrot Bebop 2 are a few of the top drones for farming.

All of these drones have attributes that make them perfect for agricultural applications, including superior cameras, protracted flight periods, and steady flight in windy circumstances.

There are numerous software alternatives available to assist with the agricultural drone industry. Pix4D, DroneDeploy, PrecisionHawk, and Sentera are some of the top software programs for agricultural drones. These software programs all provide various features and advantages that can support your agricultural drone business.



Security

Public safety is one of the sectors with the fastest rate of growth in the globe, and it offers numerous fascinating UAV work prospects.



Numerous different types of drones can be employed to assist you in your work, regardless of your interest in search and rescue operations, disaster relief logistics, wildlife protection, or any other field of public safety work.

Parrot ANAFI USA, DJI Mavic 2 Enterprise Advanced, DJI Matrice 300 RTK, DJI's Matrice 300, and Phantom 4 Pro V2.0 are some of the best public safety drones currently available.

Depending on your unique needs, a wide variety of software is available for UAV pilots.

The DJI Terra, Pix4D Mapper, DJI GS Pro, Agisoft, and DroneDeploy, among other software tools, can be extremely helpful to this industry.

The DJI GS Pro app is an effective ground station tool that makes it simple to plan and carry out challenging missions.

DroneDeploy has features like mapping and 3D modeling capabilities and is excellent for applications related to public safety.



Education

Drones of a variety of designs are suitable for usage in educational settings. The DJI Phantom 4 Pro V2.0, DJI Mavic 3, Mavic Air 2, and DJI Tello are a few of the most



These drones have a number of characteristics that make them perfect for educational purposes, including excellent image quality, lengthy battery life, and simple controls.

It is crucial to take into account the particular requirements of your students and educators when choosing a drone for usage in this industry. Age of your students, the depth of your lesson, and the kind of educational activity you'll be employing the drone for are a few things to consider.

Drone pilots seeking to put their skills to use have access to a number of apps and educational materials.

Some well-liked choices include the Aerial Robotics Curriculum, which offers thorough lesson plans and activities for teaching drone technology in classrooms, and the Remote Pilot Ground School app, which aids students in getting ready for the FAA Part 107 exam.

DroneBlocks, which offers STEM and real-world applications of drone technology through apps, a drone coding curriculum, a simulator, and professional development, is another helpful tool. the Flight Projector app, which enables users to show a live stream of their drone's camera onto a classroom screen, and the DroneDeploy app, which enables users to create and share 3D maps and models.



Telecommunications

There are numerous drone models that are suitable for usage in the telecommunications sector.

A few well-liked choices include the DJI Phantom 4 and

Matrice 300.

Because to its exceptional flight performance and steadiness, the DJI Phantom 4 is a fantastic choice for telecommunications work.

You can have a prosperous career as a drone pilot in the communications sector if you have the correct mix of technical know-how and interpersonal abilities.

It's critical to think about the software you'll use with your drone in addition to picking the best drone for your telecommunications job.

For drone communications tasks, some well-liked software alternatives include:

- DroneDeploy
- Optelos
- PrecisionHawk
- Pix4D

You could need to employ more than one of these drone software systems, depending on the kind of work you'll be conducting.



More information

<https://www.youtube.com/watch?v=9Xje3cqnG-Q>



3.2

How to use a drone: basic information



They are:

- Understand the drone controller
- Flight terminologies
- Considerations before flight operations
- Practice basic drone movements



Figure 2: The basic layout of a drone controller

Introduction to the drone controller

The most common configuration of a drone controller always has two analogue sticks. These are used to control the drone's flight movement. The diagram in Figure 2 shows the basic layout of the controller. The left stick (L) is used to control the yaw and throttle while the right stick (R) is used to control the roll and pitch movements.



The basic drone movements

The Pitch movement is when the drone is moved forward or backward along the horizontal plane (x-axis). To achieve this movement the right stick is pushed forward or backward.

The roll movement is when the drone is moved to the left or to the right along the roll axis. To perform this movement the right stick is moved to the left or right.

The yaw movement is when the drone is turned in a clockwise direction along the vertical axis. To achieve this movement the drone operator must move the left stick to the left or right direction.

The throttle is when the drone is accelerated up or down along the vertical plane. The representation of each of these movements are shown in Figure 3

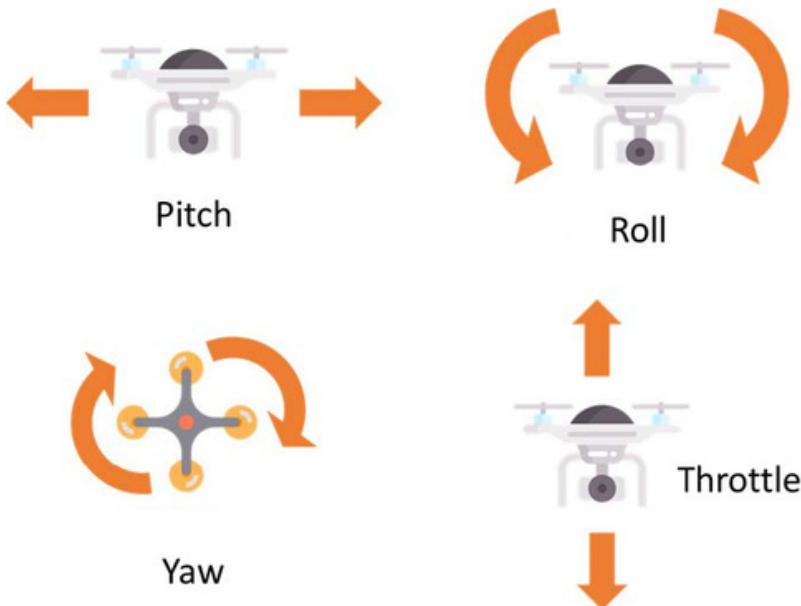


Figure 3:
The basic four
drone movements

Most drone controllers have additional buttons especially those drones which have a camera. Such buttons include trim button, this button performs an automatic alignment of the drone in case it starts to drift (ex. Due to a sudden draft of wind).

Another button which is present on most drone controllers is the return to home button. Just as its name suggest it is used to call the drone back to the starting position. For those drones equipped with a camera, buttons to record videos and take images are also present on the controller.

Considerations before flight operation

Even though regulations may vary depending on your country the following are some basic points that can be used as a guide before trying out the exercises in the next section.

Regulations and flight environment:

- Check with the relevant authorities if your drone needs to be registered and if insurance is required
- Always make sure that the area where you are going to use your drone is safe for flight.
- Some countries have restrictions for drone use depending on the time of day. In many countries it is not permissible to fly a drone at night. Night-time is generally considered to be between 30 minutes after sunset and 30 minutes before sunrise (official times).





Drone checks:

- Always perform a visual check of the drone for any noticeable damages or signs of wear and tear.
- Make sure that all components such as rotor, hull, batteries, motors and camera are securely mounted
- Check for free movement of the rotors
- After connecting the batteries and switching on the drone make sure that the functions work properly.



More information

<https://www.droneblog.com/drone-controller/>

<https://drones.duke.edu/general-practice-things-to-know>

http://canberragrammar.github.io/DroneSchool/course_materials/first_flight_exercises.html

<https://droneflyingpro.com/drone-flying-practice-drills/>

3.3 Detailed instructions on how to fly safely and comply with flying regulations, including advice on how to avoid accidents and how to handle emergency situations

When flying a drone, it is very important to follow the rules and regulations for safe flight. To use drones safely and efficiently, there are some rules to follow:

- **Drone registration:** In most countries, you must register your drone before you can use it. Find out about local laws and regulations and register it if necessary.
- **Weather conditions:** Check weather conditions before flying your drone. Drones are not suitable for flight in rain or wind. Avoid flying near thunderstorms and do not fly at high altitudes in high winds.



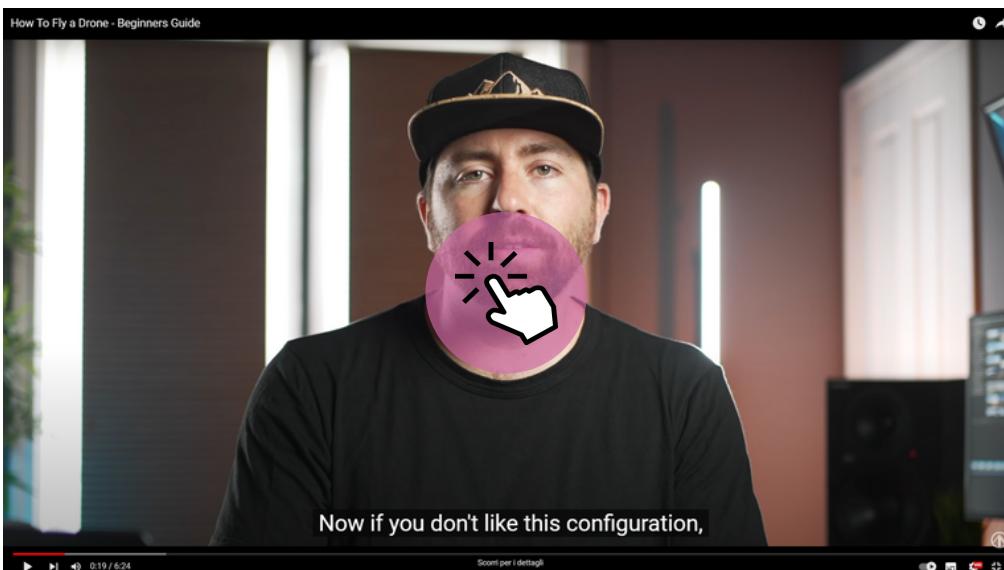


- **Altitude restriction:** be aware of altitude restrictions. Most countries have altitude restrictions for flying drones. Find out what the limits are in your country and comply with them.
- **Distance restriction:** comply with the distance restrictions required by law. Drones must not be flown in areas where they could endanger people, animals or property.
- **Be aware of your surroundings:** check the area to be flown before flying. Make sure the area is safe and that there are no obstructions such as trees, wires, or other structures that could impede flight.
- **Always keep the drone in view:** You must be able to see the drone at all times during flight. If you lose control of the drone, use the "Return to Base" feature if the drone has it.
- **Always check the battery:** the drone relies on an external power supply. Therefore, make sure the batteries are always charged before flying. Also, keep an eye on the flight time and bring the drone to its launch point on time.
- **Dealing with emergencies:** If you lose control of the drone, try to stay calm. Do not use the “Return to base” feature near obstacles such as trees or other structures, but instead try to steer the drone into an open area.
- **Respect privacy.** Do not fly over private areas or people unless you have their permission to film.



More information

<https://www.youtube.com/watch?v=1tnc0Vx3sXU>



3.4 Overview of the different shooting techniques used in drone journalism, including advice on how to get the best footage and how to use drones to get unique and creative angles



Drones are used in journalism to capture various types of photographs and footage. The use of drones provides an opportunity to use this technology to create unique, visually rich, and informative reports and news stories. Examples of journalistic photos and footage:



- Aerial photography can be used to show a bird's eye view of places and provide a glimpse of a location that is not otherwise visible.
- Drones are a great tool for reporting. Journalists can use aerial photography to cover major events, natural disasters or mass gatherings.
- Drones are often used to film sporting events such as football games, car races, skiing and other sports. Aerial footage can show a game or competition from a unique angle, adding value and attracting more viewers. In this way, sporting events also become visually appealing.
- Drones can be used to capture images of nature and wildlife. Drone footage shows the beauty of nature and wildlife from unique angles that most people would never see. This allows them to get closer to remote locations and dangerous animals.



More information

<https://www.youtube.com/watch?v=S46kvP-dp6U>



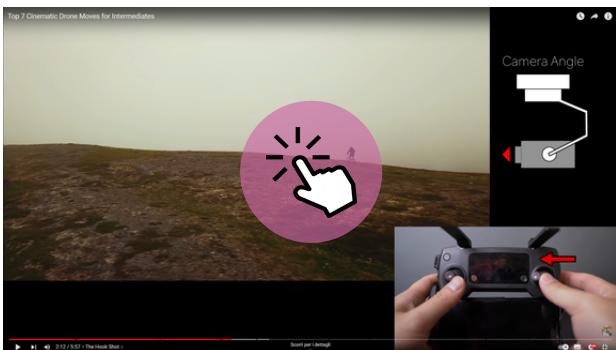
https://www.youtube.com/watch?v=mode_N5-gTs



https://www.youtube.com/watch?v=JICSTat6k_M



<https://www.youtube.com/watch?v=3mLxhGnRwRo>



3.5 Software and tools used to edit and share content produced with drones, including advice on how best to use these tools to create professional-quality content

DJI GO 4:

This is a mobile app for DJI drones that allows you to control the drone and capture photos and videos. The app also includes basic editing tools to trim clips, add music, and adjust color and exposure. To use DJI GO 4 to create professional-quality content, it's important to understand the basic principles of videography, such as framing, composition, and lighting. You should also practice flying the drone to capture smooth, stable shots



Adobe Premiere Pro

This is a professional-grade video editing software that can handle high-resolution footage from drones. It includes advanced editing tools for color correction, audio mixing, and special effects. To use Premiere Pro to create professional-quality content, it's important to have a good understanding of the software and its capabilities. You should also have a basic understanding of video editing principles, such as pacing, rhythm, and narrative structure.

Final Cut Pro X

This is another professional-grade video editing software that is popular among drone videographers. It includes advanced tools for color correction, audio mixing, and special effects. To use Final Cut Pro X to create professional-quality content, it's important to have a good understanding of the software and its capabilities. You should also have a basic understanding of video editing principles, such as pacing, rhythm, and narrative structure



Luminar AI

This is a photo editing software that uses artificial intelligence to enhance photos. It includes features like sky replacement, object removal, and portrait enhancement. Use Luminar AI to create professional-quality content, it's important to have a good understanding of photo editing principles, such as color correction, exposure adjustment, and composition. You should also be familiar with how to use the software's AI-powered features to enhance your photos in a natural and subtle way

Pix4D

This is a mapping and modeling software for drone data. It allows you to create 2D and 3D models, orthomosaics, and point clouds from drone imagery. To use Pix4D to create professional-quality content, it's important to have a good understanding of photogrammetry and how to capture high-quality drone imagery. You should also be familiar with how to use the software to process and analyze the imagery to create accurate and detailed models.

By using these software and tools and following tips, you can create professional-quality content produced with drones. Here are some additional tips to keep in mind:



- Shoot in RAW or DNG format to capture the highest-quality footage or photos, which will give you more flexibility when editing.
- Use a color profile that is optimized for drone footage, such as D-Log or D-Cinelike, to capture the most dynamic range.
- Plan your shots ahead of time to ensure that you capture the footage or photos you need to tell a compelling story.
- Use a gimbal or stabilization software to capture smooth, stable footage.
- Consider adding music or sound effects to enhance the emotional impact of your content.
- Use appropriate transitions and pacing to create a smooth and engaging viewing experience.

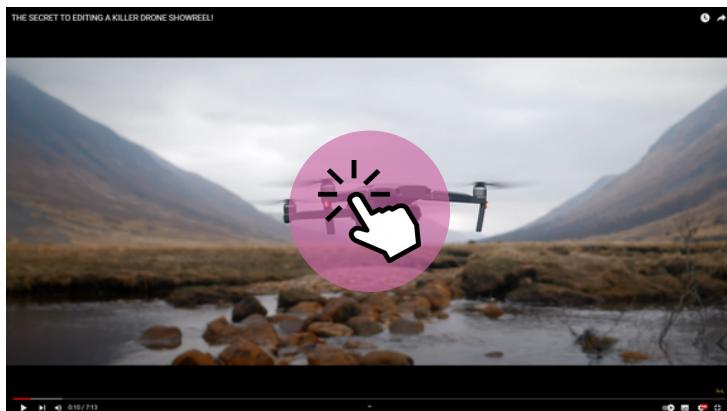


More information

https://www.youtube.com/watch?v=3_Ple25IPbM



<https://www.youtube.com/watch?v=EF8Ip2QDEWg>



CHAPTER D. EVALUATION



The evaluation tool is composed by:

Ongoing evaluation through online evaluation at the end of each module (to establish the degree of understanding of modules in the view of being able to proceed with the next module)



Post-training knowledge assessment questionnaire (to measure knowledge acquisition prompted by the training)



Trainees satisfaction

Feedback form of the General Evaluation Tool (to receive feedback on the course's components)



 **Evaluation available at the platform**
drones-programme.netlify.app



DRONES



drones-programme.netlify.app/



[Drones Project](#)