**White paper**

**U-Space, Drones and Military Low Level Flights[[1]](#footnote-1)**

August 2019

With the inevitable increase in drones operating in the 500 feet and below airspace, in the coming years, early engagement with all airspace users is paramount. In considering the implementation of the U-Space, the key objectives for the Military are:

1. To maintain the level of **Safety** for Military (low-level) operations[[2]](#footnote-2), to preserve operational effectiveness and to protect Search and Rescue operations.
2. To guarantee the **Security** of (Military) infrastructures, assets and operations.
3. To quantify the **financial impacts** of U-Space implementation on the Military and to secure the necessary funding to maintain safety, guarantee security and ensure interoperability.

In order to meet these objectives, civil-military collaboration is vital, both at the National and the Regional level.

This document is the Military request for States to promote and implement the following measures which should be performed by the Civilian Authorities[[3]](#footnote-3) in coordination with the Military Authorities:

1. **EDUCATION**

Proper training, greater education and information/awareness campaigns targeting the different civilian drone operators (hobbyist, recreational, professional) should be planned at European/National level. The drone operators must be made aware of other types of airspace users, the safety risks, duties, liabilities, insurance requirements, responsibilities, restrictions and third-party privacy issues associated with their drone operations. These are essential requirements as lack of awareness and negligence could result in safety incidents or accidents, or that the drone operators may be conducting unlawful activities. The possibility for drone operators to be confronted with Military activities, including low-level flights of Military aircraft, should be emphasized during their education and awareness campaigns.

1. **MEANS**

It is essential that States have the appropriate resources to educate operators and the power and means to enforce regulation to guarantee the safety of manned aviation – civilian and military – as well as third parties on the ground. Malicious use of drones is not acceptable, should not be accepted under any circumstance and must be prosecuted with proportionate punishments by competent Authorities using fully applicable legal action to deter any intent or to deal with offenders. With this, it is essential to clearly define the roles and responsibilities of each stakeholder (e.g. airports, Air Navigation Service Providers and Authorities) with regards to the detection, identification and neutralization of drones and the identification and apprehension of the operator if necessary.

1. **U-SPACE**

The mutual use of the U-Space will be complex, consequently, it is important that:

* The roles and responsibilities of the civilian and military Air Navigation Service Providers and U-Space Service Providers are clearly defined.
* The access to U-Space areas/services should be clearly defined for Military operators.
* The visibility and tracking of all civilian drones connected to the U-Space must be ensured.
* The confidentiality of some Military missions in the U-Space context must be preserved.
* Security aspects, both physical and cyber, should be considered from the beginning of the development of the U-Space.
* U-Space must not prevent the military from gaining timely access to all areas within the States to carry out assigned tasks.
1. **RESEARCH**

Additional studies should consider the increasing number of drones expected to fly in the future and the way they will operate, as well as the different types of Military missions at low level.

* Collision study: The impact of a collision between (a) drone(s) and a manned aircraft, especially a rotorcraft, should be further investigated and mitigation means should be enforced (e.g. frangibility criteria for manufacturers of drones).
* Counter-measures: Technological solutions to prevent or neutralize drones entering restricted/sensitive airspace should be developed. The industry should implement measures to deny access of malicious drones in certain areas, such as airport vicinities (at Approach and Departure, but not only), independently of the cooperation of the drone user.
* Identification, Electronic Conspicuity, Flight Planning and Clearances: Some drones may operate Beyond Line of Sight and consideration should be given to being identifiable and visible to ATC, when required.
* Cyber: The cyber risks linked to drone specificities (e.g. C2 link) must further be investigated and prevention means put in place against cyber-attacks on drones.
1. **COSTS:**

Any costs for the Military resulting from the U-Space implementation, the protection of critical infrastructure or operations should be evaluated and mitigated by appropriate funding, including at EU level.

**Annex: Operations for traffic below 500ft AGL: a Military view**

**SUMMARY**

In general, the airspace below 500ft AGL is an important operational sphere for the Military and flights at low level are conducted in daily operations according standard Military procedures. Military aircraft, particularly helicopters, operate below 500ft AGL so it must be considered whenever dealing with U-Space.

This Annex reflects generic missions/operations below 500ft which are not necessarily under EDA scope. Those missions/operations may have different rules, according to the States regulations. State aircraft operations (see drawing above), other than Military, seems to be quite concerned by the UTM/U-Space changes (e.g. police, customs, civil protection). Those are not represented by EDA and there is no visibility on which European body could represent those Airspace Users in the framework of U-Space development.

EDA is closely following UTM/U-Space changes for the potential impact of UTM/U-Space on the security/safety of people, their operations and infrastructure (e.g. need for counter-measures). EDA’s involvement in this domain could also bring opportunities to the Military.

EDA’s activities in the framework of UTM development are limited to the potential implications on Military aircraft highlighted in red in the drawing below (EDA does not address State Aircraft users related issues in white on the drawing).

**Military aircraft will operate below 500ft, whenever the mission dictates.**

* Military operate below 500ft according the Military rules specified by each State.
* Military operate below 500ft when there is coordination for de-confliction in case of several air assets.
* Military operate below 500ft complying with the Airspace restrictions (e.g. prohibited Area, restricted Area, Area closed by Notam), ATC instructions and with consideration to areas with wildlife (e.g. birds concentration).
* In some States, additional restrictions may apply when flying above urban area and groups of people (in case of emergency it allows the aircraft to execute a forced landing outside of populated area or area occupied by group of people/animal colonies like farms). In other States, Military aircraft can overfly cities if necessary due to the mission (often related to police/custom support missions). However, pilots are trained to avoid urban area for safety reasons and for noise abatement.

THE MISSIONS

The missions that may require Military operations or training to be conducted below 500ft are very broad, for example:

* High visibility events (HVE) security;
* Search and rescue (SAR);
* Counter-terrorism;
* Anti-Submarine Warfare;
* Close Air support;
* Parachute-Jumping;
* Medical evacuation (MEDEVAC);
* Helicopter troop boarding/unloading;
* Fisheries and sea lane control;
* Low level flight training (day and night);
* Air Drop;
* Natural disaster relief;
* Combat SAR training;
* Flights in bad/critical weather situation & tactical flights;
* …

THE ENVIRONMENT

Missions/operations below 500ft are performed in different airspaces having different status in several countries:

* Segregated Airspace operations below 500ft, or
* Non-segregated Airspace operations below 500ft
* Generally non-segregated operations at low level happen when there is no time to have the airspace segregated (tactical level management).

“Routine” flights operate daily in segregated or non-segregated areas (States dependent).

1. Extracts of the document “We are ALL ONE in the sky” published in April 2019 by civilian Aviation stakeholders are quoted in this document [↑](#footnote-ref-1)
2. See annex “Operations for traffic below 500ft AGL: a Military view” [↑](#footnote-ref-2)
3. “Authorities” encompass the European Commission, EASA and/or National Authorities [↑](#footnote-ref-3)