UAVDACH
ASSOCIATION FOR UNMANNED AVIATION

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Drone detection and countermeasures

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6 Demands of UAV DACH for effective and efficient drone detection and countermeasures in the public interest and for commercial drone operations

This document was created within UAV DACH in collaboration with its internal committees and with the participation of its members!

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Introduction

UAV DACH is committed to promoting the safe, responsible, and economically sustainable commercial operation of unmanned aircraft systems (UAS) in Europe. Unmanned aviation is a key driver of innovation – however, its benefits for industry, authorities, and society can only be fully realized if trust, legal clarity, and a high level of safety in lower airspace are guaranteed.

UAV DACH defines "lower airspace" as the airspace relevant to commercial drone operations and in which the visibility of all airspace participants cannot be reliably guaranteed at present.

This airspace offers great potential for applications in the public interest. These include services for security, supply, and inspection.

However, illegal and abusive drone use endangers people, critical infrastructure, and public support for commercial applications. The association therefore supports political and social measures for the effective detection and prevention of illegal drone use – in accordance with fundamental rights, data protection, and an innovation- and business-friendly regulatory framework.

A unified air situation picture, powerful detection and countermeasures capabilities, clear responsibilities, and interoperable, European-harmonized standards are not only a response to misuse, but also a central basis for scaling commercial unmanned aviation.

Against this background, UAV DACH has formulated the following six demands as a contribution to effective and efficient drone detection and countermeasures.

These create a framework for the rapid growth of commercial drone applications in the coming years, while at the same time increasing public acceptance and safety in lower airspace.

Demands of the UAS industry

1) Creation of a uniform European air situation picture in lower airspace

Background/rationale

- Effective and efficient drone detection and countermeasures require the visibility of all aircraft in lower airspace and reliable differentiation between legal and illegal drone operations.
- The cascade of detect, validate, classify, and intervene as an operational reference framework in upper airspace should serve as a model; However, technical differences in signal characteristics, size, and flight profiles of the systems require specialized detection and classification algorithms using AI, as well as adapted tactical rules of engagement (e.g., using special police drones or C-UAS effectors that enable safe neutralization or control, minimize collateral damage, and maintain public safety).
- A real-time air situation picture is not only essential for effective and efficient drone detection and countermeasures, but also for the safe, uniform, and inclusive use of lower airspace, especially in light of the increasing number of commercial drone applications in the coming years.
- UAV DACH supports the establishment of industrial, fully automated drone operations as a commercially necessary further development of the industry; for this, the seamless, reliable detection of all air traffic participants is imperative – and thus a comprehensive, uniform air situation picture as the basis for safe and scalable operations.

Measures/demands

- Creation of a comprehensive European real-time air situation picture for lower airspace to distinguish between legal and illegal drone operations with binding rules of engagement, clear responsibilities, and technical interoperability between detection infrastructure and government response capabilities
- Agreement on European standards, taking into account interoperability and cross-border traffic
- Increase public safety by investing in aviation detection systems to detect and clearly identify all air traffic movements in lower airspace

2) Mandatory Europe-wide introduction of ADS-L for all drones and aircraft in lower airspace

Background/rationale

- Security authorities, operators, and airspace users require electronic visibility and identification of all aircraft in lower airspace
- As things stand today, the identification systems used or prescribed are not sufficient to provide a comprehensive air situation picture with clear identification in real time; as a result, no one can currently identify which aircraft are in lower airspace, their intentions, or their location
- For the establishment of industrial, fully automated drone operations, the seamless detectability of all air traffic participants is imperative and scalable systems are required
- ADS-L meets these requirements and is already recognized as an identification standard in the EU and by the European Aviation Safety Agency (EASA) (e.g., SERA 6005). From an industrial perspective, it is also very inexpensive and scalable. UAV DACH is consistently extending this standard to the entire lower airspace and is therefore advocating for the comprehensive and mandatory introduction of ADS–L.
- ADS–L provides the technical basis for creating electronic cyber-secure visibility (eConspicuity) for all aircraft in lower airspace, thereby establishing a comparable automatic position and identity reporting system to that used in upper airspace.
- Just as the position, operator, and purpose of aircraft in upper airspace can be viewed via platforms such as FlightRadar24, this visibility can also be transferred to lower airspace with the help of ADS–L.

- Systems such as RemoteID, with which many UAS are currently equipped, are insufficient, do not fully meet the above requirements, and can be replaced by ADS–L.

Measures/demands
- EU-wide introduction of ADS–L as a mandatory standard for all aircraft in lower airspace
- Activation of all drones only after successful, unambiguous identification of the operator and generation of a cyber-secure certificate ("electronic ignition lock")

3) Holistic and complete definition of all possible threat scenarios

Background/rationale
- There are a multitude of possible threat scenarios involving uncooperative drones, which differ in terms of the type of drone, the type of operation, the type of threat potential, the probability of occurrence, the identifiability, and the type of countermeasures.
- It is not sufficient to focus on just a few (current) threat scenarios and only take action when further scenarios occur.
- A comprehensive overview of all possible threat scenarios makes it possible to identify and define requirements and standards for the procurement of detection and countermeasures technologies in the interest of the entire UAS industry.
- This also reveals which technological gaps still exist and need to be closed by industry-related or targeted research and funding projects
- The goal is to establish a comprehensive, resilient system for drone detection and countermeasures based on the interlocking interaction of legal frameworks, technological capabilities, organizational structures, and human expertise
- This system must become an integral part of existing national risk management and form the basis for a coordinated, secure, and legally compliant response to current and future threats in lower airspace

Measures/demands
- Systematic identification and definition of all possible threat scenarios posed by unmanned aircraft systems.
- Assessment of all scenarios according to probability of occurrence and effect/impact, differentiated according to primary and secondary effects
- Definition of measures for the proactive reduction of the probability of occurrence
- Definition of measures for the occurrence of each scenario, including legal framework, standards, responsibilities, processes, resources, technologies, decision-making powers/pathways
- Identification of existing detection and countermeasures technologies that cover as many scenarios as possible, including identification of remaining technological gaps
- Derivation of clear guidelines for the procurement of the necessary technology as a binding framework for industry

4) Industry-related research and targeted national and European funding programs

Background/rationale
- The UAS industry needs a holistic research and funding strategy at both the national and European levels; currently, there is not a single funding program that explicitly addresses the topic of UAS, let alone drone detection and countermeasures
- Research funding and public procurement of innovative technologies are often characterized by lengthy procedures with rigid bureaucratic regulations, resulting in valuable time being lost between technological progress and operational implementation.

- In highly dynamic areas such as drone detection and countermeasures, technologies develop in short cycles; long procurement and funding cycles reduce effectiveness, responsiveness, and competitiveness.
- Particularly in strongly state-influenced fields of application (protection of critical infrastructure, security tasks), the transfer of excellent research into marketable, ready-to-use systems (including integration, testing, certification) remains insufficient too often; at the same time, pressure is increasing due to the strengthening of resilience and competitiveness in Europe
- Highly innovative development takes place disproportionately often in start-ups and young companies. Disproportionate suitability, creditworthiness, or track record requirements can effectively exclude these players—and thus prevent economic innovation potential
- Reliable, rapid piloting and procurement by the public sector creates references and investment security and can specifically stimulate private investment in safety-relevant UAS technologies.

Measures/demands

- Expansion of the national and European research and funding strategy, taking into account the holistic definition of threat scenarios required under point 3.
- Opening up public procurement processes as an active instrument of industrial policy
- Implementation of consistent, industry-oriented, and milestone-oriented funding for drone detection and countermeasures technologies as a strategic prerequisite for Europe's security, competitiveness, resilience, and ability to act
- Massive expansion of rapid selection and approval procedures ("sprint" principle) in order to be able to respond quickly to new threat situations and technological breakthroughs
- Significant reduction of entry barriers for start-ups/young companies in funding and procurement processes

5) Establishment of a European center of excellence for "drone detection and countermeasures"

Background/rationale

- Sectoral solo efforts, disputes over competences and responsibilities, lack of overview of all possible threat scenarios, lack of overview of existing technologies and technological gaps, preference for large companies, lack of a legal framework, inconsistent standards, and still unclear political responsibilities are neither in the interest of effective and efficient drone detection and countermeasures nor in the interest of industry and the public.
- Drone technologies are developing rapidly, while individual states have so far pursued fragmented solutions and focused only on individual threat scenarios or solutions.
- A joint center would pool expertise, harmonize standards, initiate and coordinate continuous research and funding measures as called for in point 4, and enable the rapid exchange of air situation pictures, innovations, and best practices, based on the holistic definition of threat scenarios called for in point 3.
- A central European center of excellence (comparable to Europol in its coordination and exchange function) for drone detection and countermeasures is necessary to effectively counter the rapidly growing and cross-border threat posed by drones used for malicious purposes.
- This would avoid duplication of effort and strengthen Europe's strategic sovereignty and resilience in the field of security.
- National activities must fit seamlessly into the European regulatory framework to ensure technical, regulatory, and operational compatibility between member states. This applies in particular to the areas of data protection, cybersecurity, aviation safety certification, and frequency management. Only through early coordination with European institutions, in particular the EASA and the European Commission, can a uniform legal and technological framework be created that guarantees planning security and market access for European companies

Measures/demands

- Establishment of a European center of excellence for drone detection and countermeasures
- Initiation and implementation of the demands set out in this paper by the European center of excellence in coordination with the national centers and taking into account the points mentioned under "Background/rationale."

6) Specification of the rules for private drone operation

Background/rationale

- Clear structures, responsibilities, and safety mechanisms have proven themselves over decades in established air traffic; against this background, it is appropriate to specify the rules for private drone operation in order to promote the increasing commercial use of drones while ensuring greater safety in lower airspace
- Legal clarity, predictability, and low-conflict operating areas are essential prerequisites for the scaling of commercial, industrial, and fully automated drone operations.
- Rule violations arise, among other things, where rules are complex, communicated inconsistently, and not sufficiently enforced; this weakens social acceptance and market development alike.
- Specifying the rules for the private operation of drones protects established safety standards and at the same time enables the orderly expansion of commercial drone applications that are socially beneficial

Measures/demands

- Private use of drones exclusively on private property with the consent of the beneficial owner or owner up to a maximum height of 50 meters
- Private use of drones beyond this is only permitted at model airfields in accordance with the rules applicable there.
- Possibility of applying for a time- and geographically-limited exemption for the private use of drones over public property/areas (e.g., to film a sporting event) up to a maximum altitude of 50 meters

About UAV DACH

UAV DACH is the oldest and largest European industry association for unmanned aviation, based in Berlin and with over 250 members from more than 10 countries.

Since its foundation in 2010, the association has been involved in numerous national, European, and international committees and organizations, contributing its expertise and technical cooperation.

UAV DACH represents the interests of commercial drone applications in Europe and pursues the following goals:

- Promoting a growing and competitive national and European UAS industry
- Enabling real-world applications through clear and practical rules
- Strengthening public acceptance through visibility, transparency, and safety
- Prevent and sanction abusive or illegal drone activities