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Defense Primer: Categories of Uncrewed Aircraft Systems

Background

The U.S. Department of Defense (DOD) develops, acquires, and fields uncrewed aircraft systems (UAS, commonly known as drones) of varying sizes and capabilities. DOD has organized uncrewed—DOD uses the terms *uncrewed* and *unmanned* interchangeably—aircraft into different categories of aircraft to facilitate a common understanding of UAS within DOD and the integration of military UAS into the National Airspace System, and to communicate its UAS requirements to Congress. Congress may consider whether DOD’s UAS categories remain a useful basis for its oversight of DOD’s stated requirements and objectives for UAS programs.

DOD UAS Categories

DOD’s “Dictionary of Military and Associated Terms” and Joint Publication JP 3-30 “Joint Air Operations” define an unmanned aircraft (UA)—also known as unmanned aerial vehicle (UAV)—as an “aircraft that does not carry a human operator and is capable of flight with or without human remote control.” A UAS is defined as a system that includes the “necessary equipment, network, and personnel to control an unmanned aircraft.” These definitions have not remained static over time, nor are they entirely consistent with those used by other federal agencies. The Department of Transportation, for example, draws its definition of an uncrewed aircraft from Title 49, Section 44801, of the *United States Code*, in which an unmanned aircraft is defined as an aircraft operated “without the possibility of direct human intervention from within or on the aircraft.” The term *unmanned aircraft* superseded other nomenclatures, namely *remotely piloted vehicle* (RPV), that were predominant in DOD parlance in the 1970s and 1980s.

Since 1988, when the now-deactivated DOD Unmanned Aerial Vehicle Joint Program Office published—at the direction of Congress (see P.L. 100-202)—DOD’s first master plan for uncrewed aircraft, DOD has sought to consolidate various military service-specific approaches to categorizing drones. While DOD initially adopted a method that focused on the mission profile of the UAS—close-range, medium-range, strategic etc.—in successive versions DOD placed greater emphasis on the physical and operational parameters of the aircraft, such as the aircraft’s weight and airspeed. In 2007, the then-Joint UAS Center of Excellence (JUAS COE) proposed DOD expand its classification scheme for UAS from what was previously three classes to five groups of aircraft. The following year, DOD adopted an amended version of the approach based on the five aircraft groups, which was subsequently released in the “FY2009-FY2034 Unmanned Systems Integrated Roadmap,” a congressionally mandated report (see P.L. 106-398, §220).

DOD continues to use the five-group approach to categorizing UAS developed in 2007-2008, today known as

the UAS Categorization Chart and published in JP 3-30 “Joint Air Operations” (see **Figure 1**). DOD’s UAS categories range from Group 1 to Group 5 and are defined according to certain attributes—the aircraft’s maximum gross takeoff weight, operating altitude, and speed. DOD’s selection of attributes such as weight and operating altitude, as well as its selection of the dividing lines between categories, was designed in part to help facilitate the integration of military drones into the National Airspace System by aligning DOD’s approach with that of the U.S. Federal Aviation Administration (FAA). For example, DOD uses 55 pounds as the upper limit of Group 2, the same figure the FAA in 14 C.F.R. Part 1 defines as the maximum takeoff weight for a small UAS.

Figure 1. DOD UAS Classification

Unmanned Aircraft Systems Categorization Chart				
UA Category	Maximum Gross Takeoff Weight (lbs)	Normal Operating Altitude (ft)	Speed (KIAS)	Representative UAS
Group 1	0-20	< 1200 AGL	100 kts	WASP III, TACMAV RQ-14A/B, Buster, Nighthawk, RQ-11B, FPASS, RQ16A, Pointer, Aqua/Terra Puma
Group 2	21-55	< 3500 AGL	< 250	ScanEagle, Silver Fox, Aerosonde
Group 3	< 1320	< 18,000 MSL	< 250	RQ-7B Shadow, RQ-15 Neptune, XPV-1 Tern, XPV-2 Mako
Group 4	> 1320		Any Airspeed	MQ-5B Hunter, MQ-8B Fire Scout, MQ-1C Gray Eagle, MQ-1A/B/C Predator
Group 5	> 1320	> 18,000 MSL	Any Airspeed	MQ-9 Reaper, RQ-4 Global Hawk, RQ-4N Triton

Legend

AGL	above ground level	lbs	pounds
FPASS	force protection aerial surveillance system	MSL	mean sea level
ft	feet	TACMAV	tactical micro air vehicle
KIAS	knots indicated airspeed	UA	unmanned aircraft
kts	knots	UAS	unmanned aircraft system

Source: DOD JP 3-30.

Globally, a variety of civil and military classification schemes exist for drones, elements of which may or may not align with DOD’s UAS categories. For example, the North Atlantic Treaty Organization (NATO) classification guide, first presented in 2009, divides UAS into three classes—Class I, II, and III—from which Class I and Class III are subdivided into groups. NATO’s Class I is subdivided into three groups—micro, mini, and small—of varying size, while Class III is subdivided into groups based on the mission of the aircraft. Other classification schemes for UAS may choose to emphasize metrics such as the aircraft’s level of automation or operating range.

Related Terminology

Attributable

DOD's approach to categorizing UAS does not include predictive values for the cost or longevity of the aircraft. However, DOD and the Air Force have used the term *attributable* to describe "a new class of unmanned aircraft that are purpose-designed and routinely *reusable*, but built *affordably* to allow a combatant commander to tolerate putting them at risk" (emphasis added). In 2020, the Air Force suggested that attributable aircraft could cost between \$2 million and \$20 million per aircraft.

Other military services have used the term *attributable* to describe uncrewed aircraft and systems. The Army, for example, has said its Launched Effects platforms are "attributable or optionally recoverable." The Army does not appear to have specified a cost range for Launched Effects; in its FY2025 budget submission to Congress, however, the Army requested \$20.04 million in procurement funding for 40 Launched Effects systems, or approximately \$501,000 per system. DOD has also described the first tranche of the Replicator program as focusing on "all-domain attributable autonomous" systems, though it has not specified the anticipated cost of the systems it anticipates acquiring under Replicator (see CRS In Focus IF12611, *DOD Replicator Initiative: Background and Issues for Congress*).

Congress has considered prescribing the notional price range of attributable aircraft in the context of the Air Force's Collaborative Combat Aircraft (CCA) program (see CRS In Focus IF12740, *U.S. Air Force Collaborative Combat Aircraft (CCA)*). The House-passed version of the FY2024 National Defense Authorization Act (NDAA) included a provision (see H.R. 2670, §218) that would have capped the value of a CCA categorized as attributable at \$10 million and also introduced two other categories of CCAs—expendable and exquisite—of lesser and greater value. The Air Force opposed setting cost targets, preferring instead to pursue the development of CCAs in two increments, each of which could have different costs and capabilities. The enacted FY2024 NDAA did not include the provision, though House and Senate conferees directed the Air Force and Navy Secretaries to submit reports on how "CCA affordability is being defined and applied for unpiloted aircraft that may be used for either attributable or expendable mission taskings" (H.Rept. 118-301).

Beyond CCAs, Congress remains concerned about DOD's consistency in its application of the term *attributable*. In an item of special interest in the House Armed Services Committee's report (H.Rept. 118-529) accompanying H.R. 8070, the House-passed FY2025 NDAA, the committee argued that DOD's definition of attributable UAS "remains ambiguous." The committee directed the Secretary of Defense—in coordination with the Secretaries of the Army, Air Force, and Navy—to provide a briefing by December 1, 2024, on how each of the services define attributable in per unit dollar amounts for all groups of UAS.

Drone

Since its entry into the U.S. military lexicon in the mid-1930s, DOD has adopted several formal and informal definitions for the word *drone*. In a contemporary U.S.

military context, the term *drone* is both a colloquialism that is used synonymously with UAV to refer to uncrewed aircraft generally—in the same manner as it is by the general public—and a word denoting types of military aircraft. One example of the latter is the U.S. Air Force's Target Drone program, which seeks to acquire aerial targets for training and for testing and evaluating weapon systems (see CRS In Focus IF12738, *Aerial Targets*).

One-Way Attack

Although DOD does not appear to have published a publicly available definition of a one-way attack UAV, DOD typically applies the term to describe a UAV that is intended for a single-use mission and equipped with an integrated, explosive warhead. Also known as loitering munitions, one-way attack UAVs are meant to fly into a point target before detonating—much like a missile—although some may be recovered and reused by the operator in certain circumstances. Some one-way attack drones may be capable of delaying an engagement to allow an operator to evaluate and select among a variety of possible targets, while others may be preprogrammed to attack specific targets. One-way attack is one of several possible single-use missions for UAVs.

Small UAS

In most DOD contexts in which the term *small UAS* is applied, it typically refers to a uncrewed aircraft that weighs less than 55 pounds, a definition that corresponds to Section 44801 of 49 U.S.C., in which a small UAS is defined as an "unmanned aircraft weighing less than 55 lb." However, one exception is that of DOD's defensive counter-UAS programs and policy. In DOD Directive 3800.01E, which established the Army as the executive agent for counter-small UAS, a small UAS refers to a UAV in Groups 1, 2, or 3 (i.e., an aircraft that weighs up to 1,320 pounds).

Considerations for Congress

Some analysts have taken issue with DOD's approach to categorizing UAS, arguing that DOD's categories convey little about other potentially valuable UAS attributes, such as the aircraft's level of automation. Critics also contend that DOD's Group 3, which includes aircraft that weigh between 55 pounds and 1,350 pounds, is too broad, and that DOD's categories are not aligned with those of U.S. allies and partners, a discrepancy that creates the potential for confusion. Others have praised DOD's UAS categories for offering greater flexibility than other approaches.

Congress has expressed its concern that DOD's approach to categorizing UAS may not remain an accurate reflection of the different classes of uncrewed aircraft. In Section 1073 of the NDAA for Fiscal Year 2022 (P.L. 117-81), Congress directed the Under Secretary of Defense for Acquisition and Sustainment (USD [A&S]) to review DOD's classification for UAS as described in JP 3-30 and determine whether any revisions are required, as well as the potential implications of such revisions, and to report its findings to Congress.

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