Designation: F 2395 – 07

Standard Terminology for Unmanned Aircraft Systems[1]

This standard is issued under the fixed designation F 2395; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This terminology covers important concepts and terms related to unmanned aircraft systems. It is intended to establish the boundaries and characteristics that will guide the development of other standards for the committee.

2. Referenced Documents

2.1 *AIAA Standard:*[2]

R-103–2004 AIAA Recommended Practice—Terminology for Unmanned Aerial Vehicles and Remotely Operated Aircraft

2.2 *Code of Federal Regulations:*[3]

14 CFR Aeronautics and Space

14 CFR Part 91.113 General Operating and Flight Rules—Right-of-Way Rules: Except Water Operations

14 CFR Part 1 Definitions and Abbreviations

3. Significance and Use

3.1 This terminology is written to provide: *(1)* precise understanding and interpretation of ASTM standards, *(2)* the characteristics of the UAS classes, requirements, and profiles which must be addressed by standards, *(3)* standard terminology to use in standards, reports, and other technical writings on the subcommittees, and *(4)* an explanation of the meanings of technical terms for the benefit of those not conversant with them.

3.2 This terminology is not intended to prevent the use of descriptive terms used to distinguish between aircraft, such as tactical, high-altitude long endurance, or micro.

4. Terminology

automated, *n*—the automatic performance of scripted actions.

autonomy, *n*—the ability of the machine to interpret its environment and make decisions that result in unscripted actions.

beyond line-of-sight, BLOS, *n*—transmitter and receiver are not in direct, point-to-point contact. See R-103–2004.

civil aviation authority, CAA, *n*—the government regulatory agency that governs aircraft, airmen, and operations. In the United States this is the Federal Aviation Administration (FAA).

control station, *n*—a system of computers and other equipment in a designated operating area that the pilot and other crewmembers use to communicate and fly the unmanned aircraft and to operate its sensors (if any).

fully autonomous, *adj*—mode of control of a UAS where the UAS is expected to execute its mission, within the preprogrammed scope, with only monitoring from the pilot-in-command. As a descriptor for *mode of control*, this term includes: (*1*) fully automatic operation, (*2*) autonomous functions (like takeoff, landing, or collision avoidance), and (*3*) "intelligent" fully autonomous operation.

light unmanned aircraft system, light-UAS, *n*—UAS with a maximum gross takeoff weight of 1320 lb or less.

line of sight, LOS, *n*—direct, point-to-point contact between a transmitter and receiver. See R-103–2004.

lost link, *n*—a situation where the control station has lost either or both of the uplink and downlink contacts with the unmanned aircraft and the pilot can no longer affect or monitor, or both, the aircraft's flight.

miniature unmanned aircraft system, mini-UAS, *n*—UAS with a maximum gross takeoff weight of 55 lb or less.

mode of control, *n*—means the pilot uses to direct the activity of the UAS. There are two modes of control: semi-autonomous and remote control. A UAS may use different modes of control in different phases of flight.

operator, *n*—means any person who causes or authorizes the operation of an aircraft, such as the owner, lessee, or bailee of an aircraft. Also, the entity responsible for compliance with airworthiness and continuing airworthiness requirements.

pilot, *n*—person who has final authority and responsibility for the operation and safety of flight. See also 14 CFR Part 1 for "pilot-in-command." Sometimes called the UAS controller, ASTM reserves the term controller for air traffic services provider.

[1] This terminology is under the jurisdiction of ASTM Committee F38 on Unmanned Aircraft Systems and is the direct responsibility of Subcommittee F38.02 on Flight Operations.

Current edition approved April 15, 2007. Published May 2007. Originally approved in 2004. Last previous edition approved in 2005 as F 2395 – 05.

[2] Available from American Institute of Aeronautics and Astronautics (AIAA), 1801 Alexander Bell Drive, Suite 500, Reston, VA 20191-4344.

[3] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

rating, *n*—statement that, as part of a certificate, sets forth special conditions, privileges, or limitations. See 14 CFR Part 1.

semi-autonomous, *adj*—mode of control of a UAS where the pilot executes changes and conducts the mission through a flight management system interface. Without this input, the UAS will perform pre-programmed automatic operations. This can, but might not, include some fully autonomous functions (like takeoff, landing, and collision avoidance).

sense-and-avoid system, S&A system, *n*—appliance which fulfills the requirements of 14 CFR Part 91.113.

small unmanned aircraft system, small-UAS, *n*—UAS with a maximum gross takeoff weight of 330 lb or less.

unmanned aircraft, UA, *n*—the airborne component of a UAS.

unmanned aircraft system, UAS, *n*—airplane, airship, powered lift, or rotorcraft that operates with the pilot in command off-board, for purposes other than sport or recreation, also known as unmanned aerial vehicle. UASs are designed to be recovered and reused. A UAS system includes all parts of the system (data-link, control station, and so forth) required to operate the aircraft. See R-103–2004. The plural of UAS is UASs.

visual range, *n*—distance that unaided (except for normal prescription eyewear) human vision can provide deconfliction during a UAS operation, and can effectively monitor the UAS.

BIBLIOGRAPHY

(**1**) Access 5, *HALE ROA Concept of Operations*, Rev 4, 2003.

(**2**) Federal Agencies Ad Hoc Autonomy Levels for Unmanned Systems Working Group Participants, *Terminology for Specifying the Autonomy Levels for Unmanned Systems, Draft Version: 0.9G*, 2003.

(**3**) Terms & Blyenburgh & Co., *Definitions Applicable to UAVs/ROA, EURO UVS*, 2002.

(**4**) Huang, et al., National Institute of Standards and Terminology (NIST), "Autonomy Levels for Unmanned Systems," SPIE Defense and Security Symposium, Nov. 2005.

(**5**) Blyenburgh and Co., *Terms and Definitions Applicable to Unmanned Aerial Vehicles Systems, Ed VI*, Aug. 2006.