



Designation: F3228 – 17

Standard Specification for Flight Data and Voice Recording in Small Aircraft¹

This standard is issued under the fixed designation F3228; 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 specification covers international standards for the flight recording aspects of airworthiness and design for “small” aircraft.

1.2 The applicant for a design approval must seek the individual guidance of their respective CAA body concerning the use of this specification as part of a certification plan. For information on which CAA regulatory bodies have accepted this specification (in whole or in part) as a means of compliance to their Small Aircraft Airworthiness regulations (hereinafter referred to as “the Rules”), refer to ASTM F44 webpage (www.ASTM.org/COMMITTEE/F44.htm) which includes CAA website links.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 Following is a list of external standards referenced throughout this specification; the earliest revision acceptable for use is indicated. In all cases later document revisions are acceptable if shown to be equivalent to the listed revision, or if otherwise formally accepted by the governing civil aviation authority; earlier revisions are not acceptable.

2.2 *ASTM Standards:*²

[F3060 Terminology for Aircraft](#)

[F3061/F3061M Specification for Systems and Equipment in Small Aircraft](#)

[F3120/F3120M Specification for Ice Protection for General Aviation Aircraft](#)

[F3233/F3233M Specification for Instrumentation in Small Aircraft](#)

¹ This specification is under the jurisdiction of ASTM Committee F44 on General Aviation Aircraft and is the direct responsibility of Subcommittee F44.50 on Systems and Equipment.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard’s Document Summary page on the ASTM website.

3. Terminology

3.1 Terminology specific to this specification is provided below. For general terminology, refer to Terminology [F3060](#).

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *aircraft type code, n*—an Aircraft Type Code (ATC) is defined by considering both the technical considerations regarding the design of the aircraft and the airworthiness level established based upon risk-based criteria; the method of defining an ATC applicable to this specification is defined in Specification [F3061/F3061M](#).

4. Flight Data and Voice Recording

NOTE 1—[Table 1](#) provides correlation between various Aircraft Type Codes and the individual requirements contained within this section; refer to [3.2.1](#). For each subsection, an indicator can be found under each ATC character field; three indicators are used:

An empty cell () in all applicable ATC character field columns indicates that an aircraft must meet the requirements of that subsection.

A white circle (○) in multiple columns indicates that the requirements of that subsection are not applicable to an aircraft *only* if all such ATC character fields are applicable.

A mark-out (×) in any of the applicable ATC character field columns indicates that the requirements of that subsection are not applicable to an aircraft if that ATC character field is applicable.

Example—An aircraft with an ATC of 1SRLLDLN is being considered. Since all applicable columns are empty for [4.1.1](#), that subsection is applicable to the aircraft.

4.1 *Cockpit Voice Recorders:*

4.1.1 Each cockpit voice recorder required by the operating rules of the governing civil aviation authority must be approved and must be installed so that the requirements of [4.1.1.1](#) – [4.1.1.6](#) are met.

4.1.1.1 The device must record voice communications transmitted from or received in the aircraft by radio.

4.1.1.2 The device must record ambient voice communications of flight crew members on the flight deck.

4.1.1.3 The device must record voice communications of flight crew members on the flight deck, using the aircraft’s interphone system.

4.1.1.4 The device must record voice or audio signals identifying navigation or approach aids introduced into a headset or speaker.

4.1.1.5 The device must record voice communications of flight crew members using the passenger loudspeaker system, if there is such a system and if the fourth channel is available in accordance with the requirements of [4.1.3.5](#).

TABLE 1 ATC Compliance Matrix, Section 4

Section	Airworthiness Level				Number of Engines		Type of Engine(s)		Stall Speed			Cruise Speed		Meteorological Conditions			Altitude		Maneuvers	
	1	2	3	4	S	M	R	T	L	M	H	L	H	D	N	I	L	H	N	A
4																				
4.1																				
4.1.1																				
4.1.1.1																				
4.1.1.2																				
4.1.1.3																				
4.1.1.4																				
4.1.1.5																				
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4.1.3.7																				
4.1.4																				
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4.2.1.5																				
4.2.1.6																				
4.2.1.7																				
4.2.1.8																				
4.2.2																				
4.2.3																				
4.2.4																				
4.2.5																				
4.2.6																				
4.2.7																				
4.2.8																				

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4.1.1.6 If Controller-Pilot-Data-Link-Communications (CP-DLC) equipment is installed, the device must record all CPDLC communications, using an approved data message set. CPDLC messages must be recorded as the output signal from the communications unit that translates the signal into usable data.

4.1.2 If required by the provisions of 4.1.1, the recording requirements for ambient voice communications on the flight deck must be met by installing a cockpit-mounted area microphone, located in the best position for recording voice communications originating at the first and second pilot stations and voice communications of other crew members on the flight deck when directed to those stations.

4.1.2.1 The microphone must be so located and, if necessary, the preamplifiers and filters of the recorder must be so adjusted or supplemented, so that the intelligibility of the recorded communications is as high as practicable when recorded under flight cockpit noise conditions and played back. Repeated aural or visual playback of the record may be used in evaluating intelligibility.

4.1.3 Each cockpit voice recorder required by the provisions of 4.1.1 must be installed so that the part of the communication or audio signals specified in 4.1.1 obtained from each of the sources is recorded on a separate channel as specified in 4.1.3.1 – 4.1.3.7.