



# Advisory Circular

## AC135-0

Revision 0

### FDR parameter requirements and FDR parameter specifications

26 March 2020

#### General

Civil Aviation Authority advisory circulars contain guidance and information about standards, practices, and procedures that the Director has found to be an **acceptable means of compliance** with the associated rules and legislation.

However the information in the advisory circular does not replace the requirement for participants to comply with their own obligations under the Civil Aviation rules, the Civil Aviation Act and other legislation.

An advisory circular reflects the Director's view on the rules and legislation. It expresses CAA policy on the relevant matter. It is not intended to be definitive. Consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable they will be added to the appropriate advisory circular. Should there be any inconsistency between this information and the rules or legislation, the rules and legislation take precedence.

An advisory circular may also include **guidance material** generally, including guidance on best practice as well as guidance to facilitate compliance with the rule requirements. However, guidance material should not be regarded as an acceptable means of compliance.

An advisory circular may also include **technical information** that is relevant to the standards or requirements.

#### Purpose

This Advisory Circular provides an acceptable means of compliance with Civil Aviation Rule Part 135 FDR parameter requirements and FDR parameter specifications.

#### Related Rules

This Advisory Circular relates specifically to rule 135 Appendix B.4 Flight data recorder.

**Change Notice**

ICAO 29th Assembly Resolution A29-3 of year 1992 urges States to promote global harmonization of national rules.

In order to implement this Resolution, Mongolian Civil Aviation Safety Regulation has been developed based on “Memorandum for Technical Cooperation” between CAA of Mongolia and New Zealand, signed on 6th of May, 1999.

Amendment 164 of Annex 1 to the Chicago Convention on International Civil Aviation urges flight crew members, ATC personnel and aircraft maintenance engineers to comply with the language proficiency requirements; and

This AC has been released in English version only under Article 14 of the Civil Aviation Law of Mongolia 1999, “Use of foreign language in civil aviation” in order to prevent any mistranslation and misuse of the aviation safety related documents.

The AC135-0 was developed based on NZ Part 135 amendment 23, dated on 30 October 2017.

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**Table 1. Part 135 - FDR Parameter Requirements**

When reading the parameter specifications from Table 2 the corresponding shaded specification should be chosen for each parameter. This table refers to the FDR requirements of 135.369.

	<b>(A)</b>	<b>(B)</b>
Parameter	23 Parameter Helicopter	25 Parameter Helicopter
1	Time	Time
2	Airspeed	Altitude
3	Altitude	Airspeed
4	Heading	Heading
5	Vertical acceleration	Vertical acceleration
6	Longitudinal acceleration	Pitch attitude
7	Pitch attitude	Roll attitude
8	Roll attitude	Radio transmitter keying
9	Altitude rate	Power in each engine: Free power turbine speed and engine torque
10	Main rotor speed	Main rotor speed
11	Free or power turbine for each engine	Altitude rate
12	Engine torque for each engine	Pilot input - primary controls
13	Primary hydraulic pressure	Flight control hydraulic pressure low
14	Secondary hydraulic pressure (if available)	Flight control hydraulic pressure selector switch position, 1 <sup>st</sup> and 2 <sup>nd</sup> stage
15	Radio transmitter keying	AFCS mode and engagement status
16	Autopilot engaged	SAS status - engaged
17	SAS status - engaged	SAS fault status
18	SAS fault status	Main gearbox temperature low
19	Collective	Main gearbox temperature high

**Table 1. Part 135 - FDR Parameter Requirements**

*When reading the parameter specifications from Table 2 the corresponding shaded specification should be chosen for each parameter. This table refers to the FDR requirements of 135.369.*

Parameter	(A)	(B)
	23 Parameter Helicopter	25 Parameter Helicopter
20	Pedal position	Controllable stabilator position
21	Lateral cyclic	Longitudinal position
22	Longitudinal cyclic	Lateral acceleration
23	Controllable stabilator position	Master warning
24		Nav 1 and Nav 2 frequency selection
25		Outside air temperature

**Table 2. Part 135 - Flight Data Recorder Parameter Specifications**

*This table refers to the FDR requirements of 135.369.*

Parameters	Range	Installed system minimum accuracy (to recovered data) <sup>1</sup>	Sampling interval (per second)	Resolution read out <sup>2</sup>
Relative time (from recorded on prior to take-off)	25 hr minimum	±0.125% per hour	1	1 sec
	24 hours		0.25	
Indicated airspeed	V <sub>m</sub> in to V <sub>d</sub> (KIAS) (minimum airspeed signal attainable with installed pitot/static system)	±5% or ±10 knots, whichever is greater	1	1 kt.
	As the installed measuring system	±3%		
Altitude	-1,000 ft to 20,000 ft pressure altitude	±100 to ±700 ft (see Table 1, TSO C51-a)	1	25 to 150 ft
	-1,000 ft to max certificated altitude of aircraft			5' to 30'
Magnetic heading	360°	±5°	1	1°
		±2°		0.5°
Vertical acceleration	-3 g to +6 g	±0.2 g in addition to ±0.3 g maximum datum	4 (or 1 per second where peaks, ref. to 1 g are recorded)	0.05 g
		±1% of max range excluding datum error of ±5%	8	0.01g
Longitudinal acceleration	±1.0 g	±1.5% max. range excluding datum error of ±5%	2	0.03 g
			4	0.01g
Lateral Acceleration	±1.0 g	±1.5% max. range excluding datum error of ±5%	4	0.01g

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This table refers to the FDR requirements of 135.369.

Parameters	Range	Installed system minimum accuracy (to recovered data) <sup>1</sup>	Sampling interval (per second)	Resolution read out <sup>2</sup>
Pitch attitude	100% of usable range	±2°	1	0.8°
	±75°		2	0.5°
Roll attitude	±60° or 100% of usable range, whichever is greater	±2°	1	0.8°
	±180°		2	0.5°
Altitude rate	±8,000 fpm	±10% Resolution 250 fpm below 12,000 ft indicated	1	250 fpm below 12,000
	±6,000 fpm	As installed	2	0.2%
<b>Engine power each engine</b>				
Main rotor speed	Maximum range	±5%	1	1% of full range
	0-130%	±2%	2	0.3% of full range
Free or power turbine	Maximum range	+5%	1 (per engine)	1% of full range
	0-130% (power Turbine Speed)	+2%		0.2% to 0.4% of full range
Engine torque	Maximum range	±5%	1 (per engine)	1% of full range
		±2%		0.2% to 0.4% of full range
<b>Flight Control - Hydraulic Pressure</b>				
Hydraulic Pressure Low	Discrete, each circuit		1	
Hydraulic Pressure Selector Switch Position, 1 <sup>st</sup> and 2 <sup>nd</sup> Stage	Discrete		1	
Primary (discrete)	High/low		1	
Secondary - if applicable (discrete)	High/low		1	

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Parameters	Range	Installed system minimum accuracy (to recovered data) <sup>1</sup>	Sampling interval (per second)	Resolution read out <sup>2</sup>
<b>Avionics</b>				
Radio transmitter keying (discrete)	On/off		1	
Autopilot engaged (discrete)	Engaged or disengaged		1	
AFCS Mode and Engagement	Discrete (5 bits necessary)		1	
SAS status - engaged (discrete)	Engaged /disengaged		1	
SAS fault status (discrete)	Fault/OK		1	
			0.25	
<b>Flight Controls</b>				
Collective	Full range	±3%	2	1% of full range
				0.5% of full range
Pedal position	Full range	±3%	2	1% of full range
				0.5% of full range
Lateral cyclic	Full range	±3%	2	1% of full range
				0.5% of full range
Longitudinal cyclic	Full range	±3%	2	1% of full range
				0.5% of full range
Controllable stabilator position	Full range	±3%	2	1% of full range
				0.4% of full range
Main Gearbox Temperature Low	As installed	As installed	0.25	0.5% of full range



**Table 2. Part 135 - Flight Data Recorder Parameter Specifications**

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Parameters	Range	Installed system minimum accuracy (to recovered data) <sup>1</sup>	Sampling interval (per second)	Resolution read out <sup>2</sup>
Main Gearbox Temperature High	As installed	As installed	0.5	0.5% of full range
Master Warning	Discrete		1	
Nav 1 and Nav 2 Frequency Selection	Full range	As installed	0.25	
Outside Air Temperature	-50°C to +90°C	±2°C	0.5	0.3°C

## Notes:

1. When data sources are aircraft instruments (except altimeters) of acceptable quality to fly the aircraft the recording system excluding these sensors (but including all other characteristics of the recording system) shall contribute no more than half of the values in this column.
2. This column applies to aircraft manufactured after October 11, 1991.

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