



# Advisory Circular

## AC125-0

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 125 FDR parameter requirements and FDR parameter specifications.

#### Related Rules

This Advisory Circular relates specifically to rule 125 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 AC125-0 was developed based on NZ Part 125 amendment 22, dated on 30 October 2017.

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**Table 1. Part 125 - 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 125.369.

	(A)	(B)	(C)	(D)
Parameter * if sensor installed	11 Parameter	17 Parameter	18 Parameter	88 Parameter
1	Time	Time	Time	Time or Relative time counts
2	Altitude	Altitude	Airspeed	Pressure Altitude
3	Airspeed	Airspeed	Altitude	Indicated airspeed or Calibrated airspeed
4	Vertical acceleration	Vertical acceleration	Heading	Heading (primary flight crew reference)
5	Heading	Heading	Vertical acceleration	Normal acceleration (vertical)
6	Time of radio transmission to/from ATC	Time of radio transmission to/from ATC	Longitudinal acceleration	Pitch attitude
7	Pitch attitude	Pitch attitude	Pitch attitude	Roll attitude
8	Roll attitude	Roll attitude	Roll attitude	Manual radio transmitter keying or CVR/DFDR synchronisation reference
9	Longitudinal acceleration	Longitudinal acceleration	Stabiliser trim position OR pitch control position	Thrust/power on each engine (primary flight crew reference)
10	Control column OR pitch control surface position	Pitch trim position	Fan/N <sub>1</sub> speed/ EPR/cockpit indications used for aircraft certification OR prop speed and torque	Autopilot engagement
11	Thrust of each engine	Control column OR pitch control surface position	Altitude rate <sup>1</sup>	Longitudinal acceleration
12		Control wheel OR lateral control surface position	Angle of attack <sup>1</sup>	Pitch control(s) position (non fly-bywire systems) Pitch control(s) position (fly-by-wire systems)

**Table 1. Part 125 - 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 125.369.

	(A)	(B)	(C)	(D)
Parameter * if sensor installed	11 Parameter	17 Parameter	18 Parameter	88 Parameter
13		Rudder pedal OR yaw control surface position	Radio transmitter keying	Lateral control(s) position (non fly-bywire systems) Lateral control(s) position (fly-by-wire systems)
14		Thrust of each engine	Trailing edge flaps	Yaw control(s) position (non fly-by-wire systems) Yaw control(s) position (fly-by-wire systems)
15		Position of each thrust reverser	Leading edge flaps	Pitch control surface(s) position
16		Trailing edge flap OR cockpit flap control position	Thrust reverser, each engine	Lateral control surface(s) position
17		Leading edge flap OR cockpit flap control position	Spoiler/ speedbrake	Yaw control surface(s) position
18			Autopilot engaged	Lateral acceleration
19				Pitch trim surface position
20				Trailing edge flap or cockpit control position
21				Leading edge flap or cockpit control position
22				Each thrust reverser position or equivalent for propeller aeroplane
23				Ground spoiler position or speed brake position
24				Outside air temperature or total air temperature
25				Autopilot/ autothrottle/AFCS mode and engagement status

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	(A)	(B)	(C)	(D)
Parameter * if sensor installed	11 Parameter	17 Parameter	18 Parameter	88 Parameter
26 *				Radio altitude
27				Localiser deviation or MLS azimuth
28				Glideslope deviation or MLS elevation
29				Marker beacon passage
30				Master warning
31				Air/ground sensor (primary aeroplane sensor, nose or main gear)
32 *				Angle of attack (if measure directly)
33				Hydraulic pressure low, each system
34 *				Groundspeed
35				GPWS
36				Landing gear position or landing gear cockpit control selection
37 *				Drift angle
38 *				Wind speed and direction
39 *				Latitude and longitude
40 *				Stick shaker and pusher activation
41 *				Windshear detection
42				Throttle/power lever position
43				Additional engine parameters
44				TCAS

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	(A)	(B)	(C)	(D)
Parameter * if sensor installed	11 Parameter	17 Parameter	18 Parameter	88 Parameter
45				DME 1 and 2 distances
46				Nav 1 and 2 selected frequency
47 *				Selected barometric setting
48 *				Selected altitude
49 *				Selected speed
50 *				Selected Mach
51 *				Selected vertical speed
52 *				Selected heading
53 *				Selected flight path
54 *				Selected decision height
55				EFIS display format
56				Multi-function/engine alerts display format
57 *				Thrust command
58 *				Thrust target
59 *				Fuel quantity in CG trim tank
60				Primary navigation system reference
61 *				Ice detection
62 *				Engine warning each engine - vibration
63 *				Engine warning each engine - over temp
64 *				Engine warning each engine - oil pressure low
65 *				Engine warning each engine - over speed

**Table 1. Part 125 - FDR Parameter Requirements**

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	(A)	(B)	(C)	(D)
Parameter * if sensor installed	11 Parameter	17 Parameter	18 Parameter	88 Parameter
66				Yaw trim surface position
67				Roll trim surface position
68				Brake pressure - left and right
69				Brake pedal application - left and right
70 *				Yaw and side-slip angle
71 *				Engine bleed valve position
72 *				De-icing or anti-icing system selection
73				Computed centre of gravity
74				AC electrical bus status
75				DC electrical bus status
76 *				APU bleed valve position
77				Hydraulic pressure each system
78				Loss of cabin pressure
79				Computer failure - critical flight and engine control systems
80 *				HUD
81 *				Para-visual display
82				Cockpit trim control input position - pitch
83				Cockpit trim control input position - roll
84				Cockpit trim control input position - yaw
85				Trailing edge flap and cockpit flap control position
86				Leading edge flap and cockpit flap control position

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	(A)	(B)	(C)	(D)
Parameter * if sensor installed	11 Parameter	17 Parameter	18 Parameter	88 Parameter
87				Ground spoiler position and speed brake selection
88				All cockpit flight control input forces - control wheel, control column, rudder pedal

**Notes:**

1. If data from the altitude encoding altimeter (100' resolution) is used then either of these parameters should also be recorded. If however, altitude is recorded at a minimum of 25' resolution then these two parameters may be omitted.

**Table 2. Part 125 - Flight Data Recorder Parameter Specifications**

This table refers to the FDR requirements of 125.369.

Parameters	Range	Sensor input accuracy <sup>1</sup>	Seconds per sampling interval	Resolution	Remarks
Time or Relative time counts	8 hours minimum 24 hours 0 to 4095	±0.125% per hour	1 4	1s	UTC time preferred when available. Counter increments each four seconds of system operation
Pressure Altitude	-1000' to maximum certificated altitude -1000' to maximum certificated altitude -1000''to maximum certificated altitude +5000'	±100' to ±700' (refer TSO C124a, C51a)	1	25' to 150' 5' to 35'	Data should be obtained from the air data computer when practicable
Indicated airspeed or Calibrated airspeed	V <sub>so</sub> to V <sub>d</sub> (KIAS) 50 KIAS or minimum value to Max V <sub>so</sub> , and V <sub>so</sub> to 1.2V <sub>d</sub>	±5% or ±10kts whichever is the greater. Resolution 2kts below 175KIAS ±5% and ±3%	1	1% 1 kt	Data should be obtained from the air data computer when practicable
Heading (primary flight crew reference)	360° 0 - 360°and discrete 'true' or 'mag'	±5° ±2°	1	1° 0.5°	When true or magnetic heading can be selected as the primary heading reference, a discrete indicating selection must be recorded
Normal acceleration (vertical)	-3g to +6g	±0.2g in addition to ±0.3g maximum datum ±1% maximum range excluding datum error of ±5%	0.25 0.125	0.03g 0.004g	

**Table 2. Part 125 - Flight Data Recorder Parameter Specifications**

*This table refers to the FDR requirements of 125.369.*

Parameters	Range	Sensor input accuracy <sup>1</sup>	Seconds per sampling interval	Resolution	Remarks
Pitch attitude	100% of usable ±75°	±2°	1 or 0.25 for aeroplanes manufactured after 2002	0.8° 0.5°	A sampling rate of 0.25 is recommended
Roll attitude	±60° or 100% of usable range, whichever is the greater ±180°	±2°	1 or 0.5 for aeroplanes manufactured after 2002	0.8° 0.5°	A sampling rate of 0.5 is recommended
Manual radio transmitter keying or CVR/DFDR synchronisation reference	Discrete - 'on' or 'off'		1		Preferably each crew member but one discrete acceptable for all transmission provided the CVR/DFDR system complies with TSO C124a CVR synchronisation requirements
Fan N <sub>1</sub> speed or EPR or cockpit indications used for aircraft certification or Propeller speed and torque (sample once/sec as close together as practicable)	Maximum range	±5%	1 per engine	1%	Sufficient parameters (e.g. EPR, N <sub>1</sub> or Torque, N <sub>p</sub> ) as appropriate to the particular engine be recorded to determine power in forward and reverse thrust, including potential overspeed conditions
Thrust/power on each engine (primary flight crew reference)	Full range forward	±2%		0.3% of full range	

**Table 2. Part 125 - Flight Data Recorder Parameter Specifications**

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Parameters	Range	Sensor input accuracy <sup>1</sup>	Seconds per sampling interval	Resolution	Remarks
Autopilot engagement	Discrete - 'on' or 'off'		1		
Longitudinal acceleration	±1g	±1.5% maximum range excluding datum error of ±5%	0.25	0.004g	
Stabiliser trim position or Pitch control(s) position (non fly-by-wire systems) <sup>2</sup>	Full range	±3% unless higher uniquely required  ±2°	1 <b>1</b>  0.5 or 0.25 for aeroplanes manufactured after 2002	1%  0.5% of full range	For aeroplanes that have a flight control break away capability that allows either pilot to operate the controls independently, record both control inputs. The control inputs may be sampled alternately once per second to produce the sampling interval of 0.5 or 0.25, as applicable
Pitch control(s) position (fly-by-wire systems)	Full range	±2°	<b>1</b> 0.5 or 0.25 for aeroplanes manufactured after 2002	0.2% of full range	
Lateral control(s) position (non fly-by-wire systems) <sup>2</sup>	Full range	±2°	<b>1</b> 0.5 or 0.25 for aeroplanes manufactured after 2002	0.2% of full range	For aeroplanes that have a flight control break away capability that allows either pilot to operate the controls independently, record both control inputs. The control inputs may be sampled alternately once per second to produce the sampling interval of 0.5 or 0.25, as applicable

**Table 2. Part 125 - Flight Data Recorder Parameter Specifications**

This table refers to the FDR requirements of 125.369.

Parameters	Range	Sensor input accuracy <sup>1</sup>	Seconds per sampling interval	Resolution	Remarks
Lateral control(s) position (fly-by-wire systems)	Full range	±2°	1 0.5 or 0.25 for aeroplanes manufactured after 2002	0.2% of full range	
Yaw control(s) position (non fly-by-wire systems) <sup>2</sup>	Full range	±2°	1 0.5	0.3% of full range	For aeroplanes that have a flight control break away capability that allows either pilot to operate the controls independently, record both control inputs. The control inputs may be sampled alternately once per second to produce the sampling interval of 0.5
Yaw control(s) position (fly-by-wire systems)	Full range	±2°	1 0.5	0.2% of full range	
Pitch control surface(s) position <sup>2</sup>	Full range	±2°	1 0.5 or 0.25 for aeroplanes manufactured after 2002	0.2% of full range	For aeroplanes fitted with multiple or split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately. The control surfaces may be sampled alternately to produce the sampling interval of 0.5 or 0.25
Lateral control surface(s) position <sup>2</sup>	Full range	±2°	1 0.5 or 0.25 for aeroplanes manufactured after 2002	0.3% of full range	A suitable combination of surface position sensors is acceptable in lieu of recording each surface separately. The control surfaces may be sampled alternately to produce the sampling interval of 0.5 or 0.25

**Table 2. Part 125 - Flight Data Recorder Parameter Specifications**

*This table refers to the FDR requirements of 125.369.*

Parameters	Range	Sensor input accuracy <sup>1</sup>	Seconds per sampling interval	Resolution	Remarks
Yaw control surface(s) position <sup>2</sup>	Full range	±2°	1 0.5	0.2% of full range	A suitable combination of surface position sensors is acceptable in lieu of recording each surface separately. The control surfaces may be sampled alternately to produce the sampling interval of 0.5
Lateral acceleration	±1g	±1.5% maximum range excluding datum error of ±5%	0.25	0.004g	Twin engine aircraft only
Pitch trim surface position	Full range	±3%	1	0.6% of full range	
Trailing edge flap or cockpit control position	Full range or discrete each position	±3° ±3° or pilot's indicator	1 2	1% 0.5% of full range	Flap position and cockpit control may each be sampled alternately at four second intervals, to give a data point every two seconds
Leading edge flap or cockpit control position	Full range or discrete each position	±3° ±3° or pilot's indicator	1 2	1% 0.5% of full range	Left and right sides, or flap position and cockpit control may each be sampled at four second intervals, so as to give a data point each two seconds
Each thrust reverser position or equivalent for propeller aeroplane	Discrete - 'stowed' or 'full reverse' Discrete - 'stowed', 'in transit', 'reverse'		1 per engine		Turbo-jet - two discrettes enable the three states to be determined Turbo-prop - one discrete
Ground spoiler position or speed brake position	Full range or discrete each position	±2°	1 or 0.5 for aeroplanes manufactured after 2002	0.5% of full range	

**Table 2. Part 125 - Flight Data Recorder Parameter Specifications**

This table refers to the FDR requirements of 125.369.

Parameters	Range	Sensor input accuracy <sup>1</sup>	Seconds per sampling interval	Resolution	Remarks
Outside air temperature or total air temperature	-50°C to +90°C	±2° C	2	0.3° C	
Autopilot / autothrottle / AFCS mode and engagement status	Discretes - suitable combination		1		Discretes should show which systems are engaged and which primary modes are controlling the flight path and speed of the aircraft
Altitude rate	±8000 fpm	±10%. Resolution 250fpm below 12,000ft indicated	1	250fpm below 12,000ft	For autoland / category III operations, each radio altimeter should be recorded, but arranged so that at least one is recorded each second.
Radio altitude	-20' to +2 500'	±2 or ±3% whichever is the greater below 500' and ±5% above 500'		1' ±5% above 500'	
Localiser deviation, MLS azimuth, or GPS latitude deviation.	±400 microamps or available sensor range as installed ±62°	As installed - ±3% recommended	1	0.3% of full range	For autoland / category III operations, each radio altimeter should be recorded, but arranged so that at least one is recorded each second. It is not necessary to record ILS and MLS at the same time, only the approach aid in use need be recorded
Glideslope deviation, MLS elevation, or GPS vertical deviation.	±400 microamps or available sensor range as installed +0.9° to +30°	As installed - ±3% recommended	1	0.3% of full range	For autoland /category III operations, each radio altimeter should be recorded, but arranged so that at least one is recorded each second. It is not necessary to record ILS and MLS at the same time, only the approach aid in use need be recorded

**Table 2. Part 125 - Flight Data Recorder Parameter Specifications**

*This table refers to the FDR requirements of 125.369.*

Parameters	Range	Sensor input accuracy <sup>1</sup>	Seconds per sampling interval	Resolution	Remarks
Marker beacon passage	Discrete - 'on' or 'off'		1		A single discrete is acceptable for all markers
Master warning	Discrete		1		Record the master warning and record each 'red' warning that cannot be determined from other parameters or from the cockpit voice recorder
Air/ground sensor (primary aeroplane sensor, nose or main gear)	Discrete - 'air' or 'ground'		1 (0.25 recommended)		
Angle of attack (need depends on altitude resolution) <sup>3</sup>	-20° to 40° or of usable range	±2°	1	0.8%	If left and right sensors are available, each may be recorded at four second intervals so as to give a data point each 0.5 second
Angle of attack (if measure directly) <sup>3</sup>	As installed	As installed	2 or 0.5 for aeroplanes manufactured after 2002	0.3% of full range	
Hydraulic pressure low, each system	Discrete - 'low' or 'normal' or available sensor range	±5%	2	0.5% of full range	
Groundspeed	As installed	Most accurate system installed	1	0.2% of full range	
GPWS	Discrete - 'warning' or 'off'		1		A suitable combination of discretely unless recorder capacity is limited in which case a single discrete for all modes is acceptable

**Table 2. Part 125 - Flight Data Recorder Parameter Specifications**

*This table refers to the FDR requirements of 125.369.*

Parameters	Range	Sensor input accuracy <sup>1</sup>	Seconds per sampling interval	Resolution	Remarks
Landing gear position or landing gear cockpit control selection	Discrete		4		A suitable combination of discretely should be recorded
Drift angle	As installed	As installed	4	0.1°	
Wind speed and direction	As installed	As installed	4	1kt and 1°	
Latitude and longitude	As installed	As installed	4	0.002°	Provided by the Primary Navigation System Reference. Where capacity permits latitude / longitude resolution should be 0.0002°
Stick shaker and pusher activation	Discrete - 'on' or 'off'		1		A suitable combination of discretely to determine activation
Windshear detection	Discrete - 'warning' or 'off'		1		
Throttle/power lever position	Full range	±2%	1 per lever	2% of full range	For aeroplanes with non-mechanically linked cockpit engine controls
Additional engine parameters	As installed	As installed	Each engine each second	2% of full range	Where capacity permits, the preferred priority is - indicated vibration level, N <sub>2</sub> , EGT, Fuel Flow, Fuel Cut-off lever position, and N <sub>3</sub> , unless the engine manufacturer recommends otherwise
TCAS	Discretely	As installed	1		A suitable combination of discretely should be recorded to determine the status of - Combined Control, Vertical Control, Up Advisory, and Down Advisory. (refer ARINC Characteristic 735 - Attachment 6E, TCAS VERTICAL RA DATA OUTPUT WORD)

**Table 2. Part 125 - Flight Data Recorder Parameter Specifications**

*This table refers to the FDR requirements of 125.369.*

Parameters	Range	Sensor input accuracy <sup>1</sup>	Seconds per sampling interval	Resolution	Remarks
DME 1 and 2 distances	0 -200nm	As installed	4	1nm	1 mile
Nav 1 and 2 selected frequency	Full range	As installed	4		Sufficient to determine selected frequency
Selected barometric setting	Full range	±5%	1 per 64 seconds	0.2% of full range	
Selected altitude	Full range	±5%	1	100'	
Selected speed	Full range	±5%	1	1kt	
Selected Mach	Full range	±5%	1	0.01	
Selected vertical speed	Full range	±5%	1	100ft/min	
Selected heading	Full range	±5%	1	1°	
Selected flight path	Full range	±5%	1	1°	
Selected decision height	Full range	±5%	64	1'	
EFIS display format	Discretes		4		Discretes should show the display system status (off, normal, fail, composite, sector, plan, navigation aids, weather radar, range, copy)
Multi-function/engine alerts display format	Discretes		4		Discretes should show the display system status (off, normal, fail) and the identity of display pages for emergency procedures need not be recorded
Thrust command	Full range	±2%	2	2% of full range	
Thrust target	Full range	±2%	4	2% of full range	

**Table 2. Part 125 - Flight Data Recorder Parameter Specifications**

*This table refers to the FDR requirements of 125.369.*

Parameters	Range	Sensor input accuracy <sup>1</sup>	Seconds per sampling interval	Resolution	Remarks
Fuel quantity in CG trim tank	Full range	±5%	1 per 64 seconds	1% of full range	
Primary navigation system reference	Discretes - 'GPS', 'INS', 'VOR/DME', 'MLS', 'Loran C', 'Omega', 'Localiser Glideslope'		4		A suitable combination of discretes to determine the Primary Navigation System reference
Ice detection	Discrete - 'ice' or 'no ice'		4		
Engine warning each engine - vibration	Discrete		1		
Engine warning each engine - over temp	Discrete		1		
Engine warning each engine - oil pressure low	Discrete		1		
Engine warning each engine - over speed	Discrete		1		
Yaw trim surface position	Full range	±3%	2	0.3% of full range	
Roll trim surface position	Full range	±3%	2	0.3% of full range	
Brake pressure - left and right	As installed	±5%	1		To determine braking effort applied by pilots or by autobrakes

**Table 2. Part 125 - Flight Data Recorder Parameter Specifications**

*This table refers to the FDR requirements of 125.369.*

Parameters	Range	Sensor input accuracy <sup>1</sup>	Seconds per sampling interval	Resolution	Remarks
Brake pedal application - left and right	Discrete or analogue - 'applied' or 'off'	±5%	1		To determine braking applied by pilots
Yaw and sideslip angle	Full range	±5%	1	0.5°	
Engine bleed valve position	Discrete - 'open' or 'closed'		4		
De-icing or anti-icing system selection	Discrete - 'on' or 'off'		4		
Computed centre of gravity	Full range	±5%	1 per 64 seconds	1% of full range	
AC electrical bus status	Discrete - 'power' or 'off'		4		Each bus
DC electrical bus status	Discrete - 'power' or 'off'		4		Each bus
APU bleed valve position	Discrete - 'open' or 'closed'		4		
Hydraulic pressure each system	Full range	±5%	2	100psi	
Loss of cabin pressure	Discrete - 'loss' or 'normal'		1		
Computer failure - critical flight and engine control systems	Discrete - 'fail' or 'normal'		4		

**Table 2. Part 125 - Flight Data Recorder Parameter Specifications**

*This table refers to the FDR requirements of 125.369.*

Parameters	Range	Sensor input accuracy <sup>1</sup>	Seconds per sampling interval	Resolution	Remarks
HUD	Discrete - 'on' or 'off'		4		
Para-visual display	Discrete - 'on' or 'off'		1		
Cockpit trim control input position - pitch	Full range	±5%	1	0.2% of full range	Where mechanical means for control inputs are not available, cockpit display trim positions should be recorded.
Cockpit trim control input position - roll	Full range	±5%	1	0.7% of full range	Where mechanical means for control inputs are not available, cockpit display trim positions should be recorded.
Cockpit trim control input position - yaw	Full range	±5%	1	0.3% of full range	Where mechanical means for control inputs are not available, cockpit display trim positions should be recorded.
Trailing edge flap and cockpit flap control position	Full range or discrete each position	±5%	2	0.5% of full range	Trailing edge flaps and cockpit flap control position may each be sampled alternately at four second intervals to provide a sample each 0.5 second
Leading edge flap and cockpit flap control position	Full range or discrete each position	±5%	1	0.5% of full range	
Ground spoiler position and speed brake selection	Full range or discrete each position	±5%	0.5	0.3% of full range	
All cockpit flight control input forces - control wheel, control column, rudder pedal	Full range - control wheel- ±70lbs, control column ±85lbs, rudder pedals, ±165lbs.	±5%	1	0.3% of full range	For fly-by-wire flight control systems, where flight control surface position is a function of the displacement of the control input device only, it is not necessary to record this parameter

**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) must contribute no more than half of the values in this column.
2. For aeroplanes that can demonstrate the capability of deriving either the control input or control movement (one from the other) for all modes of operation and flight regimes only the surface position OR the control position need be sensed. For aeroplanes with non-mechanical control systems (fly-by-wire) both surface and control position must be recorded.
3. If data from the altitude encoding altimeter (100' resolution) is used then either of these parameters should also be recorded. If however, altitude is recorded at a minimum of 25' resolution then these two parameters may be omitted.

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