

New Larger Aeroplanes — Infringement of the Obstacle Free Zone: Operational Measures and Aeronautical Study
(Cir 301)

Operation of New Larger Aeroplanes at Existing Aerodromes (Cir 305)

Attachment D to Chapter 4

SELECTED AEROPLANE CHARACTERISTICS

Data are provided for convenience, are subject to change and should be used only as a guide. Accurate data should be obtained from the aircraft manufacturer's documentation. Many aeroplane types have optional weights and different engine models and engine thrusts; therefore pavement aspects and reference field lengths will vary, in some cases enough to change the aeroplane category. Reference field length should not be used for the design of aerodrome runway length, as the required length will vary depending on various factors such as aerodrome elevation, reference temperature and runway slope.

<i>Aircraft model</i>	<i>Take-off weight (kg)</i>	<i>Aerodrome Reference Code</i>	<i>Reference field length (m)*</i>	<i>Wingspan (m)</i>	<i>Outer main gear wheel span (m)</i>	<i>Nose gear to main gear distance (wheel base) (m)</i>	<i>Cockpit to main gear distance (m)</i>	<i>Fuselage length (m)</i>	<i>Overall length (maximum) (m)</i>	<i>Maximum tail height (m)</i>	<i>Approach speed (1.3×V_s) (kt)</i>	<i>Maximum evacuation slide length (m)*****</i>
AIRBUS A318-100	68 000	3C	1 789	34.1	8.9	10.3	15.3	31.5	31.5	12.9	124	7.2
A319-100	75 500	4C	1 800	34.1	8.9	11.4	16.5	33.5	33.5	12.2	128	7.2
A320-200	77 000	4C	2 025	34.1	8.9	12.6	17.7	37.6	37.6	12.2	136	7.5
A321-200	93 500	4C	2 533	34.1	8.9	16.9	22.0	44.5	44.5	12.1	142	6.2
A300B4-200	165 000	4D	2 727	44.8	11.1	18.6	25.3	53.2	54.1	16.7	137	9.0
A300-600R	170 500	4D	2 279	44.8	11.1	18.6	25.3	53.2	54.1	16.7	135	9.0
A310-300	164 000	4D	2 350	43.9	11.0	15.2	21.9	45.9	46.7	16.0	139	6.9
A330-200	233 000	4E	2 479	60.3	12.6	22.2	28.9	57.3	58.4	18.2	136	11.5
A330-300	233 000	4E	2 490	60.3	12.6	25.4	32.0	62.6	63.7	17.2	137	11.5
A340-200	275 000	4E	2 906	60.3	12.6	22.2	28.9	58.3	59.4	17.0	136	11.0
A340-300	276 500	4E	2 993	60.3	12.6	25.4	32.0	62.6	63.7	17.0	139	11.0
A340-500	380 000	4E	3 023	63.4	12.6	28.0	34.5	66.0	67.9	17.5	142	10.9
A340-600	380 000	4E	2 864	63.4	12.6	33.1	39.8	73.5	75.4	17.9	148	10.5
A380-800	560 000	4F	2 779	79.8	14.3	29.7	36.4	70.4	72.7	24.4	138	15.2
ANTONOV An-2	5 500	1B	500	18.2	3.4	8.3	−0.6	12.7	12.4	4.1	62	
An-3	5 800	1B	390	18.2	3.5	8.3	−0.6	14.0	13.9	4.9	65	
An-28	6 500	1B	585	22.1	3.4	4.4	3.1	12.7	13.1	4.9	89	
An-38-100	9 500	2B	965	22.1	3.4	6.2	4.9	15.3	15.7	5.5	108	
An-38-200	9 930	2B	1 125	22.1	3.4	6.2	4.9	15.3	15.7	5.5	119	

<i>Aircraft model</i>	<i>Take-off weight (kg)</i>	<i>Aerodrome Reference Code</i>	<i>Reference field length (m)*</i>	<i>Wingspan (m)</i>	<i>Outer main gear wheel span (m)</i>	<i>Nose gear to main gear distance (wheel base) (m)</i>	<i>Cockpit to main gear distance (m)</i>	<i>Fuselage length (m)</i>	<i>Overall length (maximum) (m)</i>	<i>Maximum tail height (m)</i>	<i>Approach speed (1.3×V_s) (kt)</i>	<i>Maximum evacuation slide length (m)*****</i>
An-24	21 000	3C	1 350	29.2	7.9	7.9	7.6	23.8	23.8	8.6	119	
An-24PB	22 500	3C	1 600	29.2	7.9	7.9	7.6	23.8	23.8	8.6	119	
An-30	22 100	3C	1 550	29.2	7.9	7.4	7.6	24.3	24.3	8.6	113	
An-32	27 000	3C	1 600	29.2	7.9	7.9	7.6	23.7	23.7	8.8	124	
An-72	31 200	3C	1 250	31.9	4.1	8.0	8.5	28.1	28.1	8.7	108	
An-148-100A	38 950	3C	1 740	28.9	4.6	10.6	10.6	26.1	29.1	8.2	124	
An-70	139 000	3D	1 610	44.1	5.9	14.0	14.9	39.7	40.6	16.4	151	
An-26	24 000	4C	1 850	29.2	7.9	7.7	7.6	23.8	23.8	8.8	124	
An-26B	25 000	4C	2 200	29.2	7.9	7.7	7.6	23.8	23.8	8.8	124	
An-32B-100	28 500	4C	2 080	29.2	7.9	7.9	7.6	23.7	23.7	8.8	127	
An-74	34 800	4C	1 920	31.9	4.1	8.0	8.5	28.1	28.1	8.7	108	
An-74TK-100	36 500	4C	1 920	31.9	4.1	8.0	8.5	28.1	28.1	8.8	108	
An-74T-200	36 500	4C	2 130	31.9	4.1	8.0	8.5	28.1	28.1	8.8	108	
An-74TK-300	37 500	4C	2 200	31.9	4.1	8.0	8.5	28.1	28.1	8.7	116	
An-140	21 000	4C	1 880	24.5	3.7	8.1	7.8	21.6	22.6	8.2	124	
An-140-100	21 500	4C	1 970	25.5	3.7	8.1	7.8	21.6	22.6	8.2	124	
An-148-100B	41 950	4C	2 020	28.9	4.6	10.6	10.6	26.1	29.1	8.2	124	
An-148-100E	43 700	4C	2 060	28.9	4.6	10.6	10.6	26.1	29.1	8.2	124	
An-158***	43 700	4C	2 060	28.6	4.6	11.7	11.8	27.8	30.8	8.2	126	
An-168***	43 700	4C	2 060	28.9	4.6	10.6	10.6	26.1	29.1	8.2	124	
An-12	61 000	4D	1 900	38.0	5.4	9.6	11.1	33.1	33.1	10.5	151	
An-22	225 000	4E	3 120	64.4	7.4	17.3	21.7	57.8	57.8	12.4	153	
An-124-100	392 000	4F	3 000	73.3	9.0	22.8	25.6	69.1	69.1	21.1	154	
An-124-100M-150	402 000	4F	3 200	73.3	9.0	22.8	25.6	69.1	69.1	21.1	160	
An-225	640 000	4F	3 430	88.40	9.01	29.30	16.27	76.62	84.00	18.10	167	
BOEING 707-320C	152 407	4D	3 079	44.4	8.0	18.0	20.9	44.4	46.6	13.0	137	6.6
717-200	54 885	3C	1 670	28.4	5.9	17.6	17.0	34.3	37.8	9.1	139	5.3
727-200	95 254	4C	3 176	32.9	7.1	19.3	21.4	41.5	46.7	10.6	136	6.1
727-200/W	95 254	4C	3 176	33.3**	7.1	19.3	21.4	41.5	46.7	10.6	136	6.1
737-200	58 332	4C	2 295	28.4	6.4	11.4	13.0	29.5	30.5	11.2	133	5.8
737-300	62 823	4C	2 170	28.9	6.4	12.4	14.0	32.2	33.4	11.2	133	7.0
737-300/W	62 823	4C	2 550	31.2**	6.4	12.4	14.0	32.2	33.4	11.2	133	7.0

<i>Aircraft model</i>	<i>Take-off weight (kg)</i>	<i>Aerodrome Reference Code</i>	<i>Reference field length (m)*</i>	<i>Wingspan (m)</i>	<i>Outer main gear wheel span (m)</i>	<i>Nose gear to main gear distance (wheel base) (m)</i>	<i>Cockpit to main gear distance (m)</i>	<i>Fuselage length (m)</i>	<i>Overall length (maximum) (m)</i>	<i>Maximum tail height (m)</i>	<i>Approach speed (1.3×V_s) (kt)</i>	<i>Maximum evacuation slide length (m)*****</i>
737-400	68 039	4C	2 550	28.9	6.4	12.4	15.9	35.2	36.4	11.2	139	7.0
737-500	60 555	4C	2 470	28.9	6.4	11.1	12.7	29.8	31.0	11.2	128	7.0
737-500/W	60 555	4C	2 454	31.1**	6.4	11.1	12.7	29.8	31.0	11.2	128	7.0
737-600	65 091	3C	1 690	34.3	7.0	11.2	12.8	29.8	31.2	12.7	125	7.0
737-600/W	65 544	3C	1 640	35.8**	7.0	11.2	12.9	29.8	31.2	12.7	125	7.0
737-700	70 080	3C	1 600	34.3	7.0	12.6	14.2	32.2	33.6	12.7	130	7.0
737-700/W	70 080	3C	1 610	35.8**	7.0	12.6	14.2	32.2	33.6	12.7	130	7.0
737-800	79 016	4C	2 090	34.3	7.0	15.6	17.2	38.0	39.5	12.6	142	7.0
737-800/W	79 016	4C	2 010	35.8**	7.0	15.6	17.2	38.0	39.5	12.6	142	7.0
737-900	79 016	4C	2 240	34.3	7.0	17.2	18.8	40.7	42.1	12.6	141	7.0
737-900ER/W	84 912	4C	2 470	35.8**	7.0	17.2	18.8	40.7	42.1	12.6	141	7.0
747-SP	318 875	4E	2 710	59.6	12.4	20.5	22.9	53.9	56.3	20.1	140	14.3
747-100	341 555	4E	3 060	59.6	12.4	25.6	28.0	68.6	70.4	19.6	144	11.8
747-200	379 203	4E	3 150	59.6	12.4	25.6	28.0	68.6	70.4	19.6	150	11.8
747-300	379 203	4E	3 292	59.6	12.4	25.6	28.0	68.6	70.4	19.6	152	14.3
747-400ER	414 130	4E	3 094	64.9	12.6	25.6	27.9	68.6	70.7	19.6	157	14.3
747-400	396 893	4E	3 048	64.9	12.6	25.6	27.9	68.6	70.7	19.5	157	14.3
747-8	442 253	4F	3 070	68.4	12.7	29.7	32.0	74.2	78.0	19.2	150***	15.7
747-8F	442 253	4F	3 070	68.4	12.7	29.7	32.0	74.2	78.0	19.2	159***	11.7
757-200	115 666	4D	1 980	38.1	8.6	18.3	22.0	47.0	47.3	13.7	137	9.3
757-200/W	115 666	4D	1 980	41.1**	8.6	18.3	22.0	47.0	47.3	13.7	137	9.3
757-300	122 470	4D	2 400	38.1	8.6	22.3	26.0	54.4	54.4	13.7	143	9.3
767-200	163 747	4D	1 981	47.6	10.8	19.7	24.3	47.2	48.5	16.1	135	8.7
767-200ER	179 623	4D	2 743	47.6	10.8	19.7	24.3	47.2	48.5	16.1	142	8.7
767-300	163 747	4D	1 981	47.6	10.9	22.8	27.4	53.7	54.9	16.0	140	8.7
767-300ER	186 880	4D	2 540	47.6	10.9	22.8	27.4	53.7	54.9	16.0	145	8.7
767-300ER/W	186 880	4D	2 540	50.9**	10.9	22.8	27.4	53.7	54.9	16.0	145	8.7
767-400ER	204 117	4D	3 140	51.9	11.0	26.2	30.7	60.1	61.4	17.0	150	9.7
777-200	247 208	4E	2 380	60.9	12.9	25.9	28.9	62.9	63.7	18.7	136	12.0
777-200ER	297 557	4E	2 890	60.9	12.9	25.9	28.9	62.9	63.7	18.7	139	12.0
777-200LR	347 815	4E	3 390	64.8	12.9	25.9	28.9	62.9	63.7	18.7	140	12.0
777-300	299 371	4E	3 140	60.9	12.9	31.2	32.3	73.1	73.9	18.7	149	12.6

<i>Aircraft model</i>	<i>Take-off weight (kg)</i>	<i>Aerodrome Reference Code</i>	<i>Reference field length (m)*</i>	<i>Wingspan (m)</i>	<i>Outer main gear wheel span (m)</i>	<i>Nose gear to main gear distance (wheel base) (m)</i>	<i>Cockpit to main gear distance (m)</i>	<i>Fuselage length (m)</i>	<i>Overall length (maximum) (m)</i>	<i>Maximum tail height (m)</i>	<i>Approach speed (1.3×V_s) (kt)</i>	<i>Maximum evacuation slide length (m)*****</i>
777-300ER	351 534	4E	3 060	64.8	12.9	31.2	32.3	73.1	73.9	18.8	149	12.6
777-9#	351 534	4E/4F	****	64.8/71.8	12.8	32.3	36.0	75.2	76.7	19.7	****	12.6
787-8	219 539	4E	2 660	60.1	11.6	22.8	25.5	55.9	56.7	16.9	140***	11.1
MD-81	64 410	4C	2 290	32.9	6.2	22.1	21.5	41.6	45.0	9.2	134	5.3
MD-82	67 812	4C	2 280	32.9	6.2	22.1	21.5	41.6	45.0	9.2	134	5.3
MD-83	72 575	4C	2 470	32.9	6.2	22.1	21.5	41.6	45.0	9.2	144	5.3
MD-87	67 812	4C	2 260	32.9	6.2	19.2	21.5	36.3	39.8	9.5	134	5.3
MD-88	72 575	4C	2 470	32.9	6.2	22.1	21.5	41.6	45.0	9.2	144	5.3
MD-90	70 760	3C	1 800	32.9	6.2	23.5	22.9	43.0	46.5	9.5	138	5.3
MD-11	285 990	4D	3 130	51.97	12.6	24.6	31.0	58.6	61.6	17.9	153	9.8
DC8-62	158 757	4D	3 100	45.2	7.6	18.5	20.5	46.6	48.0	13.2	138	6.7
DC9-15	41 504	4C	1 990	27.3	6.0	13.3	12.7	28.1	31.8	8.4	132	5.3
DC9-20	45 813	3C	1 560	28.4	6.0	13.3	12.7	28.1	31.8	8.4	126	5.3
DC9-50	55 338	4C	2 451	28.5	5.9	18.6	18.0	37.0	40.7	8.8	135	5.3
BOMBARDIER CS100****	54 930	3C	1 509	35.1	8.0	12.9	13.7	34.9	34.9	11.5	127	
CS100 ER****	58 151	3C	1 509	35.1	8.0	12.9	13.7	34.9	34.9	11.5	127	
CS300****	59 783	4C	1 902	35.1	8.0	14.5	15.3	38.1	38.1	11.5	133	
CS300 XT****	59 783	3C	1 661	35.1	8.0	14.5	15.3	38.1	38.1	11.5	133	
CS300 ER****	63 321	4C	1 890	35.1	8.0	14.5	15.3	38.1	38.1	11.5	133	
CRJ200ER	23 133	3B	1 680	21.2	4.0	11.4	10.8	24.4	26.8	6.3	140	
CRJ200R	24 040	4B	1 835	21.2	4.0	11.4	10.8	24.4	26.8	6.3	140	
CRJ700	32 999	3B	1 606	23.3	5.0	15.0	14.4	29.7	32.3	7.6	135	
CRJ700ER	34 019	3B	1 724	23.3	5.0	15.0	14.4	29.7	32.3	7.6	135	
CRJ700R****	34 927	4B	1 851	23.3	5.0	15.0	14.4	29.7	32.3	7.6	136	
CRJ900	36 514	3B	1 778	23.3	5.0	17.3	16.8	33.5	36.2	7.4	136	
CRJ900ER	37 421	4C	1 862	24.9	5.0	17.3	16.8	33.5	36.2	7.4	136	
CRJ900R	38 329	4C	1 954	24.9	5.0	17.3	16.8	33.5	36.2	7.4	137	
CRJ1000****	40 823	4C	1 996	26.2	5.1	18.8	18.3	36.2	39.1	7.5	138	
CRJ1000ER****	41 640	4C	2 079	26.2	5.1	18.8	18.3	36.2	39.1	7.5	138	
DHC-8-100	15 650	2C	890	25.9	7.9	8.0	6.1	20.8	22.3	7.5	101	
DHC-8-200	16 465	2C	1 020	25.9	8.5	8.0	6.1	20.8	22.3	7.5	102	
DHC-8-300	18 643	2C	1 063	27.4	8.5	10.0	8.2	24.2	25.7	7.5	107	

<i>Aircraft model</i>	<i>Take-off weight (kg)</i>	<i>Aerodrome Reference Code</i>	<i>Reference field length (m)*</i>	<i>Wingspan (m)</i>	<i>Outer main gear wheel span (m)</i>	<i>Nose gear to main gear distance (wheel base) (m)</i>	<i>Cockpit to main gear distance (m)</i>	<i>Fuselage length (m)</i>	<i>Overall length (maximum) (m)</i>	<i>Maximum tail height (m)</i>	<i>Approach speed (1.3×V_s) (kt)</i>	<i>Maximum evacuation slide length (m)*****</i>
DHC-8-400	27 987	3C	1 288	28.4	8.8	14.0	12.2	31.0	32.8	8.3	125	
EMBRAER ERJ 170-100 STD	35 990	3C	1 439	26.0	6.2	10.6	11.5	29.9	29.9	9.7	124	
ERJ 170-100 LR, SU and SE	37 200	3C	1 532	26.0	6.2	10.6	11.5	29.9	29.9	9.7	124	
ERJ 170-100 + SB 170-00-0016	38 600	3C	1 644	26.0	6.2	10.6	11.5	29.9	29.9	9.7	125	
ERJ 170-200 STD	37 500	3C	1 562	26.0	6.2	11.4	12.3	31.7	31.7	9.7	126	
ER 170-200 LR and SU	38 790	3C	1 667	26.0	6.2	11.4	12.3	31.7	31.7	9.7	126	
ERJ 170-200 + SB 170-00-0016	40 370	4C	2 244	26.0	6.2	11.4	12.3	31.7	31.7	9.7	126	
ERJ 190-100 STD	47 790	3C	1 476	28.7	7.1	13.8	14.8	36.3	36.3	10.6	124	
ERJ 190-100 LR	50 300	3C	1 616	28.7	7.1	13.8	14.8	36.3	36.3	10.6	124	
ERJ 190-100 IGW	51 800	3C	1 704	28.7	7.1	13.8	14.8	36.3	36.3	10.6	125	
ERJ 190-200 STD	48 790	3C	1 597	28.7	7.1	14.6	15.6	38.7	38.7	10.5	126	
ERJ 190-200 LR	50 790	3C	1 721	28.7	7.1	14.6	15.6	38.7	38.7	10.5	126	
ERJ 190-200 IGW	52 290	4C	1 818	28.7	7.1	14.6	15.6	38.7	38.7	10.5	128	
* Reference field length reflects the model/engine combination that provides the shortest field length and the standard conditions (maximum weight, sea level, std day, A/C off, runway dry with no slope). ** Span includes optional winglets. *** Preliminary data. **** Preliminary data — aircraft not yet certified. ***** Longest deployed slide lengths, including upper deck slides, referenced from aircraft centre line as measured horizontally. Data are based primarily on aircraft rescue fire fighting charts. # Aircraft with folding wing tips (FWT)												

MAXIMUM LENGTH⁽¹⁾ OF EVACUATION SLIDES

<i>Model</i>	<i>Deployed length ⁽²⁾ (metres)</i>	<i>Model</i>	<i>Deployed length ⁽²⁾ (metres)</i>
737-600/-700/-800/-900	7.0	A300-600	9.0
747-100/-200 (upper deck)	11.8	A310	6.9
747-100/-200 (lower deck)	11.5	A318	7.2
747-300/-400 (upper deck)	14.3	A319	7.2
747-300/-400 (lower deck)	11.5	A320	7.5
757-200/-300	9.3	A321	6.2
767-200/-300	8.7	A330-200/-300	11.5
767-400	9.7	A340-200/-300	11
777-200/-200ER/-200LR/-200F	12.0	A340-500	10.9
777-300/-300ER	12.6	A340-600	10.5
		A380	15.2

No data available for 787 or 747-8 at this time.

(1) Due to the variety of slides and slide manufacturers only the longest slides and average lengths are indicated here.

(2) Deployed lengths referenced are from the aircraft centre line as measured horizontally. Data are based primarily on aircraft rescue and fire fighting charts.

PART II — AERODROME OPERATIONAL MANAGEMENT

Chapter 1

TRAINING

1.1 GENERAL

1.1.1 The activities conducted by an aerodrome operator require the competence and appropriate training of personnel in order to carry out their assigned tasks.

1.1.2 This training is generally conducted by the individual's employer, but may also be conducted by the aerodrome operator or third parties.

1.1.3 This chapter provides the general obligations related to training programmes and competence checks for all personnel carrying out the procedures detailed in each of the following chapters of this document.

Note.— Training for other activities, not contained in Part II of this document, may be carried out depending on the needs identified by the aerodrome operator.

1.1.4 Additional material related to training procedures, including more detailed programmes or requirements, can be found in a number of chapters in Part II of this document.

Note.— The additional material has been provided to add information related to activity-specific training.

1.2 OBJECTIVES

1.2.1 Aerodrome operators shall ensure that training programmes are developed and implemented for all personnel involved in aerodrome operations.

1.2.2 The training programmes shall include procedures for the verification of personnel knowledge and for the practical application thereof, at adequate intervals.

1.3 OPERATIONAL PRACTICES

1.3.1 Aerodrome operators shall be responsible for ensuring that their staff and all personnel involved in aerodrome operations at the aerodrome are competent for each task they are required to carry out. The details of the training will vary depending on the person's experience and background and the complexity of the required task.

1.3.2 Training objectives shall be identified to ensure that competence is achieved and maintained. Based on these objectives, the training programme should include content and frequency for each technical subject, as well as a method to track the progress of the required training and the maintenance of training records.

1.3.3 A training programme should include:

- a) theoretical training;
- b) practical or on-the-job training;
- c) testing of understanding; and
- d) demonstrating competence or recurrent theoretical and/or practical training.

Note 1.— Provisions on demonstrating competence are included in the Appendix to this chapter.

Note 2.— Demonstration of continued competence is an alternative to recurrent training.

Note 3.— The attachment to this chapter provides guidance on the structure of a training programme.

1.3.4 Refresher training should be provided following an accident, incident or serious occurrence, if training-related issues have been identified as a contributing factor, or after a long-term absence to ensure that personnel are kept abreast of the most recent material, developments and practices.

Appendix to Chapter 1

DEMONSTRATING COMPETENCE

1.1 In order to demonstrate competence in a specific task, personnel shall demonstrate that the theory, practical training and local knowledge can be applied together in a satisfactory way, usually by successfully completing a competence check.

1.2 Competence checks may be used as an alternative to recurrent training whereby personnel demonstrate continued competence in a task and therefore do not require recurrent training.

1.3 Competence checks can be completed during day-to-day activities by having a competent individual accompany and assess the staff member on a task they are required to complete.

1.4 Records of all the steps taken to achieve the task shall be made and an evaluation shall be completed.

1.5 For a team or section to be recognized as competent, periodical audits or checks should be carried out and recorded. All shortfalls should be addressed by reviewing and updating the training material, refresher training or the frequency of recurrent training. Similarly, after any accident, incident or serious occurrence, it may be prudent to review training programmes to ensure that they remain appropriate.
