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II

(Non-legislative acts)

REGULATIONS

COMMISSION IMPLEMENTING REGULATION (EU) 2021/1223

of 27 July 2021

specifying the technical items of the data set, establishing the technical formats for transmission of information and specifying the detailed arrangements and content of the quality reports on the organisation of a sample survey in the use of information and communication technologies domain for reference year 2022 pursuant to Regulation (EU) 2019/1700 of the European Parliament and of the Council

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) 2019/1700 of the European Parliament and of the Council of 10 October 2019 establishing a common framework for European statistics relating to persons and households, based on data at individual level collected from samples, amending Regulations (EC) No 808/2004, (EC) No 452/2008 and (EC) No 1338/2008 of the European Parliament and of the Council, and repealing Regulation (EC) No 1177/2003 of the European Parliament and of the Council and Council Regulation (EC) No 577/98 ⁽¹⁾, and in particular Article 7(1), Article 8(3) and Article 13(6) thereof,

Whereas:

- (1) In order to facilitate the transmission of information from the Member States to the Commission (Eurostat), technical formats covering concepts, processes, including data and metadata, should be put in place for the transmission of information.
- (2) For the purpose of assessing the quality of statistics to be transmitted for the domain use of information and communication technologies, the detailed arrangements for the quality reports should be specified.
- (3) The Member States and the Union institutions should use for the categories of the characteristics listed in the Annex of this Regulation, where appropriate, the statistical classifications for the territorial units, education, occupation and economic sector that are compatible with the NUTS ⁽²⁾, ISCED ⁽³⁾, ISCO ⁽⁴⁾ and NACE ⁽⁵⁾ classifications.
- (4) The measures provided for in this Regulation are in accordance with the opinion of the European Statistical System Committee,

⁽¹⁾ OJ L 261 I, 14.10.2019, p. 1.

⁽²⁾ Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003 on the establishment of a common classification of territorial units for statistics (NUTS) (OJ L 154, 21.6.2003, p. 1).

⁽³⁾ International Standard Classification of Education 2011, <http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf> (available in English and French).

⁽⁴⁾ Commission Recommendation of 29 October 2009 on the use of the International Standard Classification of Occupations (ISCO-08) (OJ L 292, 10.11.2009, p. 31).

⁽⁵⁾ Regulation (EC) No 1893/2006 of the European Parliament and of the Council of 20 December 2006 establishing the statistical classification of economic activities NACE Revision 2 and amending Council Regulation (EEC) No 3037/90 as well as certain EC Regulations on specific statistical domains (OJ L 393, 30.12.2006, p. 1).

HAS ADOPTED THIS REGULATION:

Article 1

Subject matter

This Regulation specifies the technical items of the data set, establishes the technical formats for the transmission of information from Member States to the Commission (Eurostat) and specifies the detailed arrangements for transmission and content of the quality reports in the use of information and communication technologies domain.

Article 2

Definitions

For the purposes of this Regulation, the following definitions shall apply:

- (1) 'fieldwork period' means the period of time during which the data collection from respondents is conducted;
- (2) 'reference period' means the period of time to which a particular item of information relates.

Article 3

Description of variables

The technical characteristics of variables shall be those laid down in the Annex and refer to:

- (a) variable identifier;
- (b) variable name and description;
- (c) codes and labels;
- (d) filter;
- (e) variable type.

Article 4

Characteristics of target populations, observation units and rules for respondents

1. The target populations in the use of information and communication technologies domain shall be private households in the territory of the Member State and individuals who have their usual residence, as defined in Article 2(11) of Regulation (EU) 2019/1700, in the territory of the Member State.
2. For the variables that concern the households listed in the Annex, information shall be collected for private households with at least one member aged 16 to 74 residing in the territory of the Member State.
3. For the variables that concern the individuals listed in the Annex, information shall be collected for individuals aged 16 to 74 residing in the territory of the Member State.
4. Information may be provided on optional basis for individuals aged under 16 or over 74.
5. The data collection for the use of information and communication technologies domain shall be carried out for a sample of private households or a sample of persons belonging to private households as observation units.

Article 5

Reference periods and date

1. The reference period for collecting statistics on the detailed topic 'interaction with public authorities' shall comprise the three last quarters of 2021 and the first quarter of 2022.
2. The reference period for collecting statistics on the detailed topics 'Connection to the internet from anywhere' and 'Effect of use' shall be the last time the activity was performed by the respondent.

3. For all other detailed topics, under the topic 'information society participation', the reference period shall be the first quarter of 2022.
4. The reference date shall be defined as the time of the first interview (DD/MM/YYYY).

Article 6

Data gathering period

For data directly provided by respondents, the fieldwork period shall be the second quarter of 2022.

Article 7

Common standards for data editing, imputation and estimation

1. Imputation, modelling or weighting shall be applied to the data where information is missing, invalid or inconsistent.
2. The procedure applied to the data shall preserve the variation and the correlation between variables. Methods that incorporate 'error components' into the imputed values shall be preferable to those that simply impute a predicted value.
3. Methods which take into account the structure or other characteristics of the joint distribution of the variables shall be preferable to the marginal or univariate approach.

Article 8

Deadline and standards for transmitting information

1. Member States shall transmit the final data to the Commission (Eurostat) by 5 October 2022. The data shall be transmitted in the form of microdata files, including appropriate weights. The data must have been fully checked and validated, using the statistical data and metadata exchange standard through the single entry point to allow the Commission (Eurostat) to retrieve the data by electronic means. That data shall comply with the validation rules in accordance with the specification of variables based on the coding and filters as described in the Annex.
2. Member States shall provide the metadata to the Commission (Eurostat) in the standard metadata structure defined by the Commission (Eurostat) within 3 months of the deadline for transmitting the microdata. The metadata shall be provided through the single entry point to allow the Commission (Eurostat) to retrieve the data by electronic means.

Article 9

Detailed arrangements and content of annual quality reports

1. Member States shall transmit to the Commission (Eurostat) an annual quality report on the use of information and communication technologies domain.
2. The annual quality report shall contain quality-related data and metadata, information on the accuracy and reliability of the survey and describe changes in basic concepts and definitions that affect the comparability over time and across countries. The quality report shall also include information on the compliance with the model questionnaire and on changes in questionnaire design that affect the comparability over time and across countries.
3. The annual quality report shall be transmitted to the Commission (Eurostat) within 3 months of the deadline for transmitting the microdata.
4. The annual quality report shall be transmitted in accordance with the technical standards established by the Commission (Eurostat).
5. The annual quality report shall be provided through the single entry point to allow the Commission (Eurostat) to retrieve the data by electronic means.

*Article 10***Entry into force**

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 27 July 2021.

For the Commission
The President
Ursula VON DER LEYEN

Description and technical formats of variables collected for each topic and detailed topic of the domain use of information and communication technologies and codes to be used

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
01.Technical Items	Data collection information	REFYEAR	Year of survey	YYYY	Year of survey (4 digits)	All households	Technical
01.Technical Items	Data collection information	INTDATE	Reference date – first interview date	DD/MM/YYYY	Reference date (10 characters)	All individuals	Technical
01.Technical items	Data collection information	STRATUM_ID	Stratum	Nnnnnn -1	Id of the stratum the individual or the household belongs to, from 1 to N, where N is the number of strata No stratification	All households	Technical
01.Technical items	Data collection information	PSU	Primary sampling unit	Nnnnnn -1	Id of the primary sampling unit the individual or the household belongs to (from 1 to N, where N is the number of PSUs) Not applicable	All households, when the target population is divided into clusters (PSUs)	Technical
01.Technical items	Identification	HH_ID	Household ID	XXnnnnnn	Unique id of the household (2 letters for country code, then maximum 22 digits)	All households	Technical
01.Technical items	Identification	IND_ID	Individual ID	XxNnnnnn	Unique id of the individual (2 letters for country code, then maximum 22 digits)	All individuals	Technical
01.Technical items	Identification	HH_REF_ID	ID of the household the individual belongs to	XxNnnnnn Blank	Id of the household the individual belongs to (2 letters for country code, then maximum 22 digits) When the individual is aged 15 or less, or 75 or more, and belongs to a household which only contains persons outside the 16-74 age group, this field shall be left blank.	All individuals	Technical

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
01.Technical items	Weights	HH_WGHT	Household weight	Nnnnn.nnnnn	Grossing up factor of the household (As many digits as necessary. Decimal point may be used, if needed.)	All households	Technical
01.Technical items	Weights	IND_WGHT	Individual weight	Nnnnnn.nnnnn	Grossing up factor of the individual (As many digits as necessary. Decimal point may be used, if needed.)	All individuals	Technical
01.Technical items	Interview characteristics	TIME	Interview duration	Nnn	Duration of interview expressed in minutes	All individuals	Technical
				Blank	Not stated		
01.Technical items	Interview characteristics	INT_TYPE	Interview type	1	Paper assisted personal interview (PAPI)	All individuals	Technical
				2	Computer assisted personal interview (CAPI)		
				3	Computer assisted telephone interview (CATI)		
				4	Computer-assisted web-interview		
				5	Other		
01.Technical items	Localisation	COUNTRY	Country of residence	Not Blank	Country of residence (SCL GEO alpha-2 code)	All households	Technical
01.Technical items	Localisation	GEO_NUTS1	Region of residence	Not Blank	NUTS 1 region (3 characters, alphanumeric)	All households	Technical
01.Technical items	Localisation	GEO_NUTS2 (optional)	Region of residence (optional)	Not Blank	NUTS 2 region (4 characters, alphanumeric)	All households	Technical
				Blank	Option not included		

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
01.Technical items	Localisation	GEO_NUTS3 (optional)	Region of residence (optional)	Not Blank	NUTS 3 region (5 characters, alphanumeric – NUTS 3 code for future alternate aggregation of regions, not for publication of NUTS 3 breakdowns)	All households	Technical
				Blank	Option not included		
01.Technical items	Localisation	DEG_URBA	Degree of urbanisation	1	Cities	All households	Technical
				2	Towns and suburbs		
				3	Rural areas		
01.Technical items	Localisation	GEO_DEV	Geographical location	1	Less developed region	All households	Technical
				2	Transition region		
				3	More developed region		
				Blank	Not stated (code for non-EU countries)		
02.Person and household characteristics	Demography	SEX	Sex	1	Male	All individuals	Collected
				2	Female		
02.Person and household characteristics	Demography	YEARBIR	Year of birth	YYYY	Year of birth (4 digits)	All individuals	Collected
02.Person and household characteristics	Demography	PASSBIR	Passing of birthday	1	Yes	All individuals	Collected
				2	No		
02.Person and household characteristics	Demography	AGE	Age in completed years	nnn	Age in completed years (from 1 to 3 digits)	All individuals	Derived
02.Person and household characteristics	Citizenship and migrant background	CITIZENSHIP	Country of main citizenship	Not blank	Country of main citizenship (SCL GEO alpha-2 code)	All individuals	Collected
				STLS	Stateless		
				FOR	Foreign citizenship but country unknown		
				Blank	Not stated		
02.Person and household characteristics	Citizenship and migrant background	CNTRYB	Country of birth	Not blank	Country of birth (SCL GEO alpha-2 code)	All individuals	Collected
				FOR	Foreign-born but country of birth unknown		
				Blank	Not stated		

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
02.Person and household characteristics	Household composition	HH_POP	Household size (number of members in the household)	Nn	Number of members of the household (including children)	All households	Collected
				Blank	Not stated		
02.Person and household characteristics	Household composition	HH_PO-P_16_24 (optional)	Number of members of the household aged from 16 to 24 (optional)	Nn	Number of members of the household aged from 16 to 24	All households	Collected
				Blank	Option not included		
02.Person and household characteristics	Household composition	HH_PO-P_16_24S (optional)	Number of students of the household aged 16 to 24 (optional)	Nn	Number of students of the household aged 16 to 24	All households	Collected
				Blank	Option not included		
02.Person and household characteristics	Household composition	HH_PO-P_25_64 (optional)	Number of members of the household aged from 25 to 64 (optional)	Nn	Number of members of the household aged 25 to 64	All households	Collected
				Blank	Option not included		
02.Person and household characteristics	Household composition	HH_POP_65_-MAX (optional)	Number of members of the household aged more than or equal to 65 (optional)	Nn	Number of members of the household aged more than or equal to 65	All households	Collected
				Blank	Option not included		
02.Person and household characteristics	Household composition	HH_CHILD	Number of children under 16	Nn	Number of children under 16	All households	Collected
				Blank	Not stated		
02.Person and household characteristics	Household composition	HH_CHIL-D_14_15 (optional)	Number of children aged from 14 to 15 (optional)	Nn	Number of children aged from 14 to 15	All households	Collected
				Blank	Option not included		

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
02.Person and household characteristics	Household composition	HH_CHIL-D_5_13 (optional)	Number of children aged from 5 to 13 (optional)	Nn	Number of children aged from 5 to 13	All households	Collected
				Blank	Option not included		
02.Person and household characteristics	Household composition	HH_CHIL-D_LE_4 (optional)	Number of children aged less than or equal to 4 (optional)	Nn	Number of children aged less than or equal to 4	All households	Collected
				Blank	Option not included		
03.Labour market participation	Main activity status (self-defined)	MAINSTAT	Main activity status (self-defined)	1	Employed	All individuals aged 16 and more	Collected
				2	Unemployed		
				3	Retired		
				4	Unable to work due to long-standing health problems		
				5	Student, pupil		
				6	Fulfilling domestic tasks		
				7	Compulsory military or civilian service		
				8	Other		
				Blank	Not stated		
				9	Not applicable		
03.Labour market participation	Elementary job characteristics	STAPRO	Status in employment in main job	1	Self-employed person with employees	Individuals where MAINSTAT = 1	Collected
				2	Self-employed person without employees		
				3	Employee		
				4	Family worker (unpaid)		
				Blank	Not stated		
				9	Not applicable		

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
03.Labour market participation	Elementary job characteristics	NACE1D (optional)	Economic activity of the local unit for main job (optional)	Not blank Blank 9	NACE code at section level (one character (from A to S)) Not stated Not applicable	Individuals where MAINSTAT = 1	Collected
03.Labour market participation	Elementary job characteristics	ISCO2D	Occupation in main job	nn Blank -1	ISCO code at 2-digit level Not stated Not applicable	Individuals where MAINSTAT = 1	Collected
03.Labour market participation	Elementary job characteristics	OCC_ICT	ICT professional or non-ICT professional	1 0 Blank 9	ICT professional Non-ICT professional Not stated Not applicable	Individuals where MAINSTAT = 1	Collected
03.Labour market participation	Elementary job characteristics	OCC_MAN	Manual worker or non-manual worker	1 0 Blank 9	Manual worker Non-manual worker Not stated Not applicable	Individuals where MAINSTAT = 1	Collected
03.Labour market participation	Elementary job characteristics	EMPST_WKT (optional)	Full- or part-time main job (self-defined) (optional)	1 2 Blank 9	Full-time job Part-time job Not stated Not applicable	Individuals where MAINSTAT = 1	Collected
03.Labour market participation	Duration of contract	EMPST_CONTR (optional)	Permanency of main job (optional)	1 2 Blank 9	Permanent job Fixed-term contract Not stated Not applicable	Individuals where STAPRO = 3	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
04.Educational attainment and background	Educational attainment level	ISCEDD	Educational attainment level (highest level of education successfully completed)	0	No formal education or below ISCED 1	All individuals aged 16 and more	Collected
				1	ISCED 1 Primary education		
				2	ISCED 2 Lower secondary education		
				3	ISCED 3 Upper secondary education		
				4	ISCED 4 Post-secondary non-tertiary education		
				5	ISCED 5 Short-cycle tertiary education		
				6	ISCED 6 Bachelor's or equivalent level		
				7	ISCED 7 Master's or equivalent level		
				8	ISCED 8 Doctoral or equivalent level		
				Blank	Not stated		
04.Educational attainment and background	Educational attainment level	ISCED	Educational attainment level aggregated	9	Not applicable	All individuals aged 16 and more	Derived
				0	At most lower secondary education level (ISCEDD = 0, 1 or 2)		
				3	Upper secondary and post-secondary non-tertiary education (ISCEDD = 3 or 4)		
				5	Tertiary education (ISCEDD = 5, 6, 7 or 8)		
				Blank	Not stated		
5. Health: status and disability, access to, availability and use of health care and health determinants	Elements of the Minimum European Health Module	GALI	Limitation in activities because of health problems	9	Not applicable	All individuals aged 16 and more	Collected
				1	Severely limited		
				2	Limited but not severely		
				3	Not limited at all		
				Blank	Not stated		
				9	Not applicable		

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
06. Income, consumption and elements of wealth, including debts	Total monthly household income	HH_IQ5	Total average net current monthly income	1	Lower equivalised net current monthly income group	All households	Collected
				2	Low to medium equivalised net current monthly income group		
				3	Medium equivalised net current monthly income group		
				4	Medium to high equivalised net current monthly income group		
				5	Higher equivalised net current monthly income group		
				Blank	Not stated		
07. Information society participation	Access to ICT	IACC	Access of the household to the internet at home (by any device)	1	Yes	All households	Collected
				0	No		
				8	Don't know		
				Blank	Not stated		
07. Information society participation	Use and frequency of use of ICT	IU	Most recent internet use, at any location, with any enabling device	1	Within the last 3 months	All individuals	Collected
				2	Between 3 months and a year ago		
				3	More than 1 year ago		
				4	Never used it		
				Blank	Not stated		
07. Information society participation	Use and frequency of use of ICT	IFUS	Average frequency of internet use in the last 3 months	1	Several times during the day	Individuals where IU = 1	Collected
				2	Once a day or almost every day		
				3	At least once a week (but not every day)		
				4	Less than once a week		
				9	Not applicable		
				Blank	Not stated		

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Internet activities	IUEM	Internet use in the last 3 months for private purpose for sending/receiving e-mails	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUPH1	Internet use in the last 3 months for private purpose for making calls (including video calls) over the internet	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUSNET	Internet use in the last 3 months for private purpose for participating in social networks (creating user profile, posting messages or other contributions)	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUCHAT1	Internet use in the last 3 months for private purpose for instant messaging (exchanging messages)	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUIF	Internet use in the last 3 months for private purpose for finding information about goods or services	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUNW1	Internet use in the last 3 months for private purpose for reading online news sites, newspapers or news magazines	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUPOL2	Internet use in the last 3 months for private purpose for expressing opinions on civic or political issues on websites or in social media	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Internet activities	IUVOTE	Internet use in the last 3 months for private purpose for taking part in online consultations or voting to define civic or political issues (such as urban planning, signing a petition)	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUMUSS1	Internet use in the last 3 months for private purpose for listening to music (such as web radio, music streaming) or downloading music	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUSTV	Internet use in the last 3 months for private purpose for watching internet streamed TV (live or catch-up) from TV broadcasters (such as [national examples])	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUVOD	Internet use in the last 3 months for private purpose for watching Video on Demand from commercial services	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUVSS	Internet use in the last 3 months for private purpose for watching video content from sharing services	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUPDG	Internet use in the last 3 months for private purpose for playing or downloading games	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Internet activities	IUPCAST (optional)	Internet use in the last 3 months for private purpose for listening to podcasts or downloading podcasts (optional)	1 0 Blank 9	Ticked Not ticked Option not included Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IHIF	Internet use in the last 3 months for private purpose for seeking health-related information (such as about injuries, diseases, nutrition, improving health)	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUMAPP	Internet use in the last 3 months for private purpose for making an appointment with a practitioner via a website or app (such as of a hospital or a health care centre)	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUAPR	Internet use in the last 3 months for private purpose for accessing personal health records online	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUOHC	Internet use in the last 3 months for private purpose for using other health services via a website or app instead of having to go to the hospital or visit a doctor (such as by getting a prescription or a consultation online)	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Internet activities	IUSELL	Internet use in the last 3 months for private purpose for selling goods or services via a website or app	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUBK	Internet use in the last 3 months for private purpose for internet banking (including mobile banking)	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUOLC	Internet use in the last 3 months for conducting learning activities for educational, professional or private purposes, by doing an online course	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUOLM	Internet use in the last 3 months for conducting learning activities for educational, professional or private purposes, by using online learning material other than a complete online course (such as video tutorials, webinars, electronic textbooks, learning apps or platforms)	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Internet activities	IUOCIS1	Internet use in the last 3 months for conducting learning activities for educational, professional or private purposes, by communicating with educators or learners using audio or video online tools	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Internet activities	IUOFE	Learning activities the respondent participated in, in the last 3 months, for formal education (e.g. school or university)	1 0 9	Ticked Not ticked Not applicable	Individuals where IUOLC = 1 or IUOLM = 1 or IUOCIS1 = 1	Collected
07. Information society participation	Internet activities	IUOW	Learning activities the respondent participated in, in the last 3 months, for professional/work-related purposes	1 0 9	Ticked Not ticked Not applicable	Individuals where IUOLC = 1 or IUOLM = 1 or IUOCIS1 = 1	Collected
07. Information society participation	Internet activities	IUOPP	Learning activities the respondent participated in, in the last 3 months, for private purpose	1 0 9	Ticked Not ticked Not applicable	Individuals where IUOLC = 1 or IUOLM = 1 or IUOCIS1 = 1	Collected
07. Information society participation	Interaction with public authorities	IGOVIP	Activities via a website or app of public authorities or public services for private purpose in the last 12 months consisting in accessing by the respondent information about himself/herself stored by public authorities or public services	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1 or IU = 2	Collected
07. Information society participation	Interaction with public authorities	IGOVIDB	Activities via a website or app of public authorities or public services for private purpose in the last 12 months consisting in accessing by the respondent information from public databases or registers (such as information about availability of books in public libraries, cadastral registers, enterprise registers)	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1 or IU = 2	Collected
07. Information society participation	Interaction with public authorities	IGOV12IF	Activities via a website or app of public authorities or public services for private purpose in the last 12 months consisting in obtaining by the respondent information (e.g. about services, benefits, entitlements, laws, opening hours)	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1 or IU = 2	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Interaction with public authorities	IGOVIX	Respondent has not accessed any personal records or databases nor obtained any information via a website or app of public authorities or public services for private purpose in the last 12 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1 or IU = 2	Collected
07. Information society participation	Interaction with public authorities	IGOV12FM	Downloading/printing official forms by the respondent from a website or app of public authorities or public services for private purpose in the last 12 months	1 0 Blank 9	Yes No Not stated Not applicable	Individuals where IU = 1 or IU = 2	Collected
07. Information society participation	Interaction with public authorities	IGOVAPR	Making an appointment or reservation by the respondent via a website or app with public authorities or public services (such as reservation of a book in a public library, appointment with a government servant or a state healthcare provider) for private purpose in the last 12 months	1 0 Blank 9	Yes No Not stated Not applicable	Individuals where IU = 1 or IU = 2	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Interaction with public authorities	IGOVPOST (Optional)	Receiving by the respondent any official communication or documents sent by public authorities via the respondent's account on a website or app (name of the service, if applicable in the country) of public authorities or services (such as notifications of fines or invoices, letters; service of court summons, court documents, [national examples]) for private purpose in the last 12 months? Usage of email or SMS based information messages or notifications that a document is available should be excluded.(optional)	1 0 Blank 9	Yes No Option not included or Not Stated Not applicable	Individuals where IU = 1 or IU = 2	Collected
07. Information society participation	Interaction with public authorities	IGOV TAX1	Submitting the respondent's own tax declaration via a website or app for private purpose in the last 12 months	1 2 3 4 5 9 Blank	Yes, the respondent did it himself/herself No, it was done automatically (by the tax authority, employer, other authority) No, the respondent delivered it to the tax authority in paper format No, someone else did it on the respondent's behalf (e.g. family member, tax adviser) No, for other reasons (e.g. not subject to income tax) Not applicable Not stated	Individuals where IU = 1 or IU = 2	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Interaction with public authorities	IGOVDC	Activities via a website or app of public authorities or public services for private purpose in the last 12 months consisting in requesting by the respondent official documents or certificates (such as graduation, birth, marriage, divorce, death, residence certificates, police or criminal records, [national examples])	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1 or IU = 2	Collected
07. Information society participation	Interaction with public authorities	IGOVBE	Activities via a website or app of public authorities or public services for private purpose in the last 12 months consisting in requesting by the respondent benefits or entitlements (such as pension, unemployment, child allowance, enrolment in schools, universities, [national examples])	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1 or IU = 2	Collected
07. Information society participation	Interaction with public authorities	IGOVRCC	Activities via a website or app of public authorities or public services for private purpose in the last 12 months consisting in making by the respondent other requests, claims or complaints (such as reporting theft to the police, launching a legal complaint, requesting legal aid, initiating a civil claim procedure in front of a court, [national examples])	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1 or IU = 2	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Interaction with public authorities	IRGOVNN	Reasons for not requesting any official documents or not making any claims via a website or app of public authorities or public services in the last 12 months – respondent did not have to request any documents or to make any claims	1 0 9	Ticked Not ticked Not applicable	Individuals where IGOVODC = 0 and IGOVBE = 0 and IGOVRCC = 0	Collected
07. Information society participation	Interaction with public authorities	IRGOVLS	Reasons for not requesting any official documents or not making any claims via a website or app of public authorities or public services in the last 12 months – lack of skills or knowledge (e.g. respondent did not know how to use the website or app or it was too complicated to use)	1 0 9	Ticked Not ticked Not applicable	Individuals where IGOVODC = 0 and IGOVBE = 0 and IGOVRCC = 0	Collected
07. Information society participation	Interaction with public authorities	IRGOVSEC	Reasons for not requesting any official documents or not making any claims via a website or app of public authorities or public services in the last 12 months – concerns about the security of personal data or unwillingness to pay online (credit card fraud)	1 0 9	Ticked Not ticked Not applicable	Individuals where IGOVODC = 0 and IGOVBE = 0 and IGOVRCC = 0	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Interaction with public authorities	IRGOVEID (Optional)	Reasons for not requesting any official documents or not making any claims via a website or app of public authorities or public services in the last 12 months – lack of electronic signature, activated electronic identification (eID) or any other tool to use the eID (required for using the services) [national examples] (optional)	1 0 Blank 9	Ticked Not ticked Option not included Not applicable	Individuals where IGOVODC = 0 and IGOVBE = 0 and IGOVRCC = 0	Collected
07. Information society participation	Interaction with public authorities	IRGOVOP	Reasons for not requesting any official documents or not making any claims via a website or app of public authorities or public services in the last 12 months – another person did it on the respondent's behalf (e.g. consultant, adviser, relative)	1 0 9	Ticked Not ticked Not applicable	Individuals where IGOVODC = 0 and IGOVBE = 0 and IGOVRCC = 0	Collected
07. Information society participation	Interaction with public authorities	IRGOVOTH	Reasons for not requesting any official documents or not making any claims via a website or app of public authorities or public services in the last 12 months – other reason	1 0 9	Ticked Not ticked Not applicable	Individuals where IGOVODC = 0 and IGOVBE = 0 and IGOVRCC = 0	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Interaction with public authorities	IGOVANYS	Respondent has interacted with public authorities	9 1 0	IF IU<> 1 and IU<> 2 THEN 9 ELSE IF IGOVIP = 1 or IGOVIDB = 1 or IGOV12IF = 1 or IGOV12FM = 1 or IGOVAPR = 1 or IGOVPOST = 1 or IGOVTAX1 = 1 or IGOVODC = 1 or IGOVBE = 1 or IGOVRCC = 1 THEN 1 ELSE 0	Individuals where IU = 1 or IU = 2	Derived
07. Information society participation	Interaction with public authorities	IIGOVDU	Issues when using a website or app of public authorities or public services in the last 12 months – website or app was difficult to use (e.g. it was not user-friendly, the wording was not clear, procedure was not well explained)	1 0 9	Ticked Not ticked Not applicable	Individuals where IGOVANYS = 1	Collected
07. Information society participation	Interaction with public authorities	IIGOVTP	Issues when using a website or app of public authorities or public services in the last 12 months –technical problems experienced when using website or app (e.g. long loading, website crashed)	1 0 9	Ticked Not ticked Not applicable	Individuals where IGOVANYS = 1	Collected
07. Information society participation	Interaction with public authorities	IIGOVEID (Optional)	Issues when using a website or app of public authorities or public services in the last 12 months –problems in using the electronic signature or electronic identification (eID) (optional)	1 0 Blank 9	Ticked Not ticked Option not included Not applicable	Individuals where IGOVANYS = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Interaction with public authorities	IIGOVPAY (Optional)	Issues when using a website or app of public authorities or public services in the last 12 months – the respondent was not able to pay via the website or app (e.g. due to lack of access to the payment methods required) (optional)	1 0 Blank 9	Ticked Not ticked Option not included Not applicable	Individuals where IGOVANYS = 1	Collected
07. Information society participation	Interaction with public authorities	IIGOVMOB	Issues when using a website or app of public authorities or public services in the last 12 months – the respondent was not able to access the service on smartphone or tablet (e.g. non compatible device version or non-available applications)	1 0 9	Ticked Not ticked Not applicable	Individuals where IGOVANYS = 1	Collected
07. Information society participation	Interaction with public authorities	IIGOVOTH	Issues when using a website or app of public authorities or public services in the last 12 months – other issue	1 0 9	Ticked Not ticked Not applicable	Individuals where IGOVANYS = 1	Collected
07. Information society participation	Interaction with public authorities	IIGOVX	The respondent has not encountered any issues when using a website or app of public authorities or public services in the last 12 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IGOVANYS = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	e-Commerce	IBUY	Last purchase or order of goods or services over the internet for private use	1 2 3 4 Blank 9	Within the last 3 months Between 3 months and a year ago More than 1 year ago Never bought or ordered over the internet Not stated Not applicable	Individuals where IU = 1 or IU = 2	Collected
07. Information society participation	e-Commerce	BCLOT1	Internet use for buying clothes (including sport clothing), shoes or accessories (such as bags, jewellery) from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BSPG	Internet use for buying sports goods (excluding sport clothing) from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BCG	Internet use for buying children toys or childcare items (such as nappies, bottles, baby strollers) from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	e-Commerce	BFURN1	Internet use for buying furniture, home accessories (such as carpets or curtains) or gardening products (such as tools, plants) from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BMUSG	Internet use for buying music as CDs, vinyls etc. from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BFLMG	Internet use for buying films or series as DVDs, Blu-ray etc. from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BBOOKNLG	Internet use for buying printed books, magazines or newspapers from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	e-Commerce	BHARD1	Internet use for buying computers, tablets, mobile phones or accessories from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BEEQU1	Internet use for buying consumer electronics (such as TV-sets, stereos, cameras, sound bars or smart speakers, virtual assistants) or household appliances (such as washing machines) from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BMED1	Internet use for buying medicine or dietary supplements such as vitamins (excluding online renewal of prescriptions) from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BFDR	Internet use for buying deliveries from restaurants, fast-food chains, catering services from enterprises or private persons via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	e-Commerce	BFDS	Internet use for buying food or beverages from stores or from meal-kits providers from enterprises or private persons via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BCBW	Internet use for buying cosmetics, beauty or wellness products from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BCPH	Internet use for buying cleaning products or personal hygiene products (such as toothbrushes, handkerchiefs, washing detergents, cleaning cloths) from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BBMC	Internet use for buying bicycles, mopeds, cars, or other vehicles or their spare parts from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	e-Commerce	BOPG	Internet use for buying other physical goods from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BPG_ANY	Internet use for buying any of the listed physical goods from enterprises or private persons (including used goods) via a website or app for private use in the last 3 months	9 1 0	IF IBUY = Blank or IBUY<> 1 THEN 9 ELSE IF BCLOT1 = 1 or BSPG = 1 or BCG = 1 or BFURN1 = 1 or BMUSG = 1 or BFLMG = 1 or BBOOKNLG = 1 or BHARD1 = 1 or BEEQU1 = 1 or BMED1 = 1 or BFDR = 1 or BFDS = 1 or BCBW = 1 or BCPH = 1 or BBMC = 1 or BOPG = 1 THEN 1 ELSE 0	Individuals where IBUY = 1	Derived
07. Information society participation	e-Commerce	BPG_DOM	Internet use for buying goods via a website or app in the last 3 months from national sellers (from enterprises or private persons)	1 0 9	Ticked Not ticked Not applicable	Individuals where BPG_ANY = 1	Collected
07. Information society participation	e-Commerce	BPG_EU	Internet use for buying goods via a website or app in the last 3 months from sellers from other EU countries (from enterprises or private persons)	1 0 9	Ticked Not ticked Not applicable	Individuals where BPG_ANY = 1	Collected
07. Information society participation	e-Commerce	BPG_WRLD	Internet use for buying goods via a website or app in the last 3 months from sellers from the rest of the world (from enterprises or private persons)	1 0 9	Ticked Not ticked Not applicable	Individuals where BPG_ANY = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	e-Commerce	BPG_UNK	Internet use for buying goods via a website or app in the last 3 months from sellers which country of origin is not known (from enterprises or private persons)	1 0 9	Ticked Not ticked Not applicable	Individuals where BPG_ANY = 1	Collected
07. Information society participation	e-Commerce	BPG_PP	Goods bought from private persons via a website or app	1 0 Blank 9	Yes No Not stated Not applicable	Individuals where BPG_ANY = 1	Collected
07. Information society participation	e-Commerce	BMUSS	Internet use for buying or subscribing to music as a streaming service or downloads via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BFLMS	Internet use for buying or subscribing to films or series as a streaming service or downloads via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BBOOKNLS	Internet use for buying or subscribing to e-books, online-magazines or online-newspapers via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BGAMES	Internet use for buying or subscribing to games online or as downloads for smartphones, tablets, computers or consoles via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	e-Commerce	BSOFTS	Internet use for buying or subscribing to computer software or other software as downloads including upgrades via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BHLFTS	Internet use for buying or subscribing to apps related to health or fitness (excluding free apps) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BAPP	Internet use for buying or subscribing to other apps (such as apps related to learning languages, travelling, weather) (excluding free apps) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BSTICK	Internet use for buying tickets to sports events via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BCTICK	Internet use for buying tickets to cultural or other events (such as tickets to cinema, concerts, fairs) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	e-Commerce	BSIMC	Internet use for buying subscriptions to the internet or mobile phone connections via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BSUTIL	Internet use for buying subscriptions to electricity, water or heating supply, waste disposal or similar services via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BHHS	Internet use for buying household services (such as cleaning, babysitting, repair work, gardening) (also when bought from private persons) via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BHHS_PP	Internet use for buying household services from private persons via a website or app for private use in the last 3 months	1 0 Blank 9	Yes No Not stated Not applicable	Individuals where BHHS = 1	Collected
07. Information society participation	e-Commerce	BTPS_E	Internet use for buying transport services from a transport enterprise, such as local bus, flight or train ticket or taxi ride via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	e-Commerce	BTPS_PP	Internet use for buying transport services from a private person via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BRA_E	Internet use for renting accommodation from enterprises such as hotels or travel agencies via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
06. Information society participation	e-Commerce	BRA_PP	Internet use for renting accommodation from a private person via a website or app for private use in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BOTS (optional)	Internet use for buying any other services (excluding financial and insurance services) via a website or app for private use in the last 3 months (optional)	1 0 Blank 9	Yes No Option not included or not stated Not applicable	Individuals where IBUY = 1	Collected
07. Information society participation	e-Commerce	BFIN_IN1	Internet use for buying insurance policies, including travel insurance, also as a package together with for example a plane ticket, via a website or app for private purposes in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	e-Commerce	BFIN_CR1	Internet use for taking a loan or mortgage or arranging credit from banks or other financial providers via a website or app for private purposes in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	e-Commerce	BFIN_SH1	Internet use for buying or selling shares, bonds, units in funds or other financial assets via a website or app for private purposes in the last 3 months	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_DEM	Use of internet-connected thermostat, utility meter, lights, plug-ins or other internet-connected solutions for energy management for the respondent's home for private purposes	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_DSEC	Use of internet-connected home alarm system, smoke detector, security cameras, door locks or other internet-connected security or safety solutions for the respondent's home for private purposes	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_DHA	Use of internet-connected home appliances such as robot vacuums, fridges, ovens, coffee machines for private purposes	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Connection to the internet from anywhere	IOT_DVA	Use of a virtual assistant in the form of a smart speaker or of an app for private purposes	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_DX	Respondent did not use any of the internet-connected devices for energy management, security or safety solutions, home appliances or virtual assistants for private purposes	1 0 9	Ticked Not ticked Not applicable	Individuals where (IOT_DEM = Blank or IOT_DEM = 0) and (IOT_DSEC = Blank or IOT_DSEC = 0) and (IOT_DHA = Blank or IOT_DHA = 0) and (IOT_DVA = Blank or IOT_DVA = 0)	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_BDK	Reasons for not using any of the internet-connected devices for energy management, security or safety solutions, home appliances or virtual assistants for private purposes – respondent did not know that such devices or systems exist	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_DX = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_BNN	Reasons for not using any of the internet-connected devices for energy management, security or safety solutions, home appliances or virtual assistants for private purposes – respondent had no need to use those connected devices or systems	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_BDK = 0	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Connection to the internet from anywhere	IOT_BCST	Reasons for not using any of the internet-connected devices for energy management, security or safety solutions, home appliances or virtual assistants for private purposes – costs too high	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_BDK = 0	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_BLC	Reasons for not using any of the internet-connected devices for energy management, security or safety solutions, home appliances or virtual assistants for private purposes – lack of compatibility with other devices or systems	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_BDK = 0	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_BLSK	Reasons for not using any of the internet-connected devices for energy management, security or safety solutions, home appliances or virtual assistants for private purposes – lack of skills to use those devices or systems	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_BDK = 0	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Connection to the internet from anywhere	IOT_BCPP	Reasons for not using any of the internet-connected devices for energy management, security or safety solutions, home appliances or virtual assistants for private purposes – concerns about the privacy and protection of data about the respondent generated by those devices or systems	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_BDK = 0	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_BCSC	Reasons for not using any of the internet-connected devices for energy management, security or safety solutions, home appliances or virtual assistants for private purposes – concerns about security (e.g. that the device or system will be hacked)	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_BDK = 0	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_BCSH	Reasons for not using any of the internet-connected devices for energy management, security or safety solutions, home appliances or virtual assistants for private purposes – concerns about safety or health (e.g. that the use of the device or system could lead to an accident, injury or health problem)	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_BDK = 0	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Connection to the internet from anywhere	IOT_BOTH	Reasons for not using any of the internet-connected devices for energy management, security or safety solutions, home appliances or virtual assistants for private purposes – other reasons	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_BDK = 0	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_IUTV	Internet use on an internet-connected TV in the respondent's home for private purposes	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_IUGC	Internet use on an internet-connected game console in the respondent's home for private purposes	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_IUHA	Internet use on an internet-connected home audio system or smart speakers in the respondent's home for private purposes	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_DCS	Use of an internet-connected smart watch, fitness band, internet-connected goggles or headsets, safety-trackers, internet-connected accessories, internet-connected clothes or shoes for private purposes	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Connection to the internet from anywhere	IOT_DHE	Use of internet-connected devices for monitoring blood pressure, sugar level, body weight (such as smart scales) or other internet-connected devices for health and medical care for private purposes	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT DTOY	Use of toys connected to the internet, such as robot toys (including educational) or dolls for private purposes	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_DCAR	Use of a car with built-in wireless internet connection for private purposes	1 0 9	Ticked Not ticked Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_USE	Respondent used internet of things	9 1 0	IF IU = Blank or IU <> 1 THEN 9 ELSE IF IOT_DEM = 1 or IOT_DSEC = 1 or IOT_DHA = 1 or IOT_DVA = 1 or IOT_IUTV = 1 or IOT_IUGC = 1 or IOT_IUHA = 1 or IOT_DCS = 1 or IOT_DHE = 1 or IOT DTOY = 1 or IOT_DCAR = 1 THEN 1 ELSE 0	Individuals where IU = 1	Derived
07. Information society participation	Connection to the internet from anywhere	IOT_PSEC	Problems encountered with the mentioned internet-connected devices or systems – security or privacy problems (e.g. the device or system was hacked, problems with the protection of information about the respondent and his/her family generated by those devices or systems)	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_USE = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Connection to the internet from anywhere	IOT_PSHE	Problems encountered with the mentioned internet-connected devices or systems – safety or health problems (e.g. the use of the device or system lead to an accident, injury or health problem)	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_USE = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_PDU	Problems encountered with the mentioned internet-connected devices or systems – difficulties with using the device (e.g. setting-up, installing, connecting, pairing the device)	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_USE = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_POTH	Problems encountered with the mentioned internet-connected devices or systems – other problems (such as connection problems, support problems)	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_USE = 1	Collected
07. Information society participation	Connection to the internet from anywhere	IOT_PX	Respondent has not encountered any problem with the mentioned internet-connected devices or systems	1 0 9	Ticked Not ticked Not applicable	Individuals where IOT_USE = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Effect of use	ECO_DMOB	Way in which the respondent dealt with his/her mobile phone or smartphone that he/she replaced or no longer use	1	It is still kept in respondent's household	Individuals where IU = 1	Collected
				2	It was sold or given away		
				3	It was disposed of in electronic waste collection/recycling (incl. leaving it to the retailer to dispose of)		
				4	It was disposed of but not in electronic waste collection/recycling		
				5	It was never bought or is still in use		
				6	Other		
				Blank	Not stated		
				9	Not applicable		
07. Information society participation	Effect of use	ECO_DLT	Way in which the respondent dealt with his/her laptop or tablet that he/she replaced or no longer use	1	It is still kept in respondent's household	Individuals where IU = 1	Collected
				2	It was sold or given away		
				3	It was disposed of in electronic waste collection/recycling (incl. leaving it to the retailer to dispose of)		
				4	It was disposed of but not in electronic waste collection/recycling		
				5	It was never bought or is still in use		
				6	Other		
				Blank	Not stated		
				9	Not applicable		

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Effect of use	ECO_DPC	Way in which the respondent dealt with his/her desktop computer that he/she replaced or no longer use	1	It is still kept in respondent's household	Individuals where IU = 1	Collected
				2	It was sold or given away		
				3	It was disposed of in electronic waste collection/recycling (incl. leaving it to the retailer to dispose of)		
				4	It was disposed of but not in electronic waste collection/recycling		
				5	It was never bought or is still in use		
				6	Other		
				Blank	Not stated		
				9	Not applicable		
07. Information society participation	Effect of use	ECO_PP (Optional)	Characteristics considered as important by the respondent when he/she most recently bought a mobile or smartphone, tablet, laptop or desktop computer – price (Optional)	1	Ticked	Individuals where IU = 1	Collected
				0	Not ticked		
				Blank	Option not included		
				9	Not applicable		
07. Information society participation	Effect of use	ECO_PHD (Optional)	Characteristics considered as important by the respondent when he/she most recently bought a mobile or smartphone, tablet, laptop or desktop computer – hard drive characteristics (storage, speed), processor speed (Optional)	1	Ticked	Individuals where IU = 1	Collected
				0	Not ticked		
				Blank	Option not included		
				9	Not applicable		

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Effect of use	ECO_PECD (Optional)	Characteristics considered as important by the respondent when he/she most recently bought a mobile or smartphone, tablet, laptop or desktop computer – eco-design of the device e.g. durable, upgradeable and repairable designs that require fewer materials; environmentally friendly materials used for packaging, etc. (Optional)	1 0 Blank 9	Ticked Not ticked Option not included Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Effect of use	ECO_PEG (Optional)	Characteristics considered as important by the respondent when he/she most recently bought a mobile or smartphone, tablet, laptop or desktop computer – possibility to extend the life span of the device by buying extra guarantee (Optional)	1 0 Blank 9	Ticked Not ticked Option not included Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Effect of use	ECO_PEE (Optional)	Characteristics considered as important by the respondent when he/she most recently bought a mobile or smartphone, tablet, laptop or desktop computer – energy efficiency of the device (Optional)	1 0 Blank 9	Ticked Not ticked Option not included Not applicable	Individuals where IU = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Effect of use	ECO_PTBS (Optional)	Characteristics considered as important by the respondent when he/she most recently bought a mobile or smartphone, tablet, laptop or desktop computer – a take-back scheme offered by manufacturer or seller (i.e. the manufacturer or seller takes the device which becomes obsolete at no cost or offers discounts to the client to purchase another device) (Optional)	1 0 Blank 9	Ticked Not ticked Option not included Not applicable	Individuals where IU = 1	Collected
07. Information society participation	Effect of use	ECO_PX (Optional)	Characteristics considered as important by the respondent when he/she most recently bought a mobile or smartphone, tablet, laptop or desktop computer – the respondent has not considered any of the mentioned characteristics (Optional)	1 0 Blank 9	Ticked Not ticked Option not included Not applicable	Individuals where IU = 1	Collected

Topic	Detailed topic	Variable identifier	Variable name/variable description	Codes	Labels/Categories	Filter	Variable type
07. Information society participation	Effect of use	ECO_PBX (Optional)	Characteristics considered as important by the respondent when he/she most recently bought a mobile or smartphone, tablet, laptop or desktop computer – the respondent never bought any of these devices (Optional)	1 0 Blank 9	Ticked Not ticked Option not included Not applicable	Individuals where IU = 1	Collected

COMMISSION IMPLEMENTING REGULATION (EU) 2021/1224**of 27 July 2021**

concerning the detailed rules on the conditions for the operation of the web service and data protection and security rules applicable to the web service as well as measures for the development and technical implementation of the web service provided for by Regulation (EU) 2017/2226 of the European Parliament and of the Council and repealing Commission Implementing Decision C(2019)1230

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) 2017/2226 of the European Parliament and of the Council of 30 November 2017 establishing an Entry/Exit System (EES) to register entry and exit data and refusal of entry data of third-country nationals crossing the external borders of the Member States and determining the conditions for access to the Entry/Exit System for law enforcement purposes, and amending the Convention implementing the Schengen Agreement and Regulations (EC) No 767/2008 and (EU) No 1077/2011 ⁽¹⁾, and in particular Article 13(7) and Article 36, first paragraph, point (h), thereof,

Whereas:

- (1) Regulation (EU) 2017/2226 establishes the Entry/Exit System, for the electronic recording and storage of the date, time and place of entry and exit of third-country nationals admitted or refused for a short stay in the territory of the Member States and calculates the duration of their authorised stay.
- (2) The European Agency for the operational management of large-scale IT systems in the area of freedom, security and justice, established by Regulation (EU) No 1077/2011 of the European Parliament and of the Council ⁽²⁾ (eu-LISA) is responsible for the development and operational management of the Entry/Exit System.
- (3) Commission Implementing Decision C(2019)1230 lays down specifications and conditions for the operation of the web service provided for in Article 13 of Regulation (EU) 2017/2226, including specific provisions for data protection and security. Those specifications and conditions must be adapted by taking into account visa-exempt travellers within the meaning of Article 45 of Regulation (EU) 2018/1240 of the European Parliament and of the Council ⁽³⁾.
- (4) Article 13(3) of Regulation (EU) 2017/2226 requires carriers to use the web service to verify whether third-country nationals holding a short-stay visa issued for one or two entries have already used the number of entries authorised by their visa.
- (5) In order to enable carriers to fulfil their obligation to verify the use of the single and double entry visa, they should have access to the web service. Carriers should access the web service through an authentication scheme and be able to dispatch and receive messages in a format to be determined by eu-LISA.
- (6) Technical rules on the message format and authentication scheme should be laid down in order to enable carriers to connect and use the web service to be specified in the technical guidelines, which are part of the technical specifications referred to in Article 37(1) of Regulation (EU) 2017/2226, to be adopted by eu-LISA.
- (7) Carriers should be able to indicate that the passengers fall outside the scope of the Regulation (EU) 2017/2226 and in such case carriers should receive an automatic 'Not applicable' reply from the web service, without querying the read only database and without logging.

⁽¹⁾ OJ L 327, 9.12.2017, p. 20.

⁽²⁾ Regulation (EU) No 1077/2011 of the European Parliament and of the Council of 25 October 2011 establishing a European Agency for the operational management of large-scale IT systems in the area of freedom, security and justice (OJ L 286, 1.11.2011, p. 1).

⁽³⁾ Regulation (EU) 2018/1240 of the European Parliament and of the Council of 12 September 2018 establishing a European Travel Information and Authorisation System (ETIAS) (OJ L 236, 19.9.2018, p. 1).

- (8) The Commission, eu-LISA and the Member States should endeavour to inform all known carriers of how and when they can register. Upon successful completion of the registration procedure as well as, where relevant, the successful completion of testing, eu-LISA should connect the carrier to the carrier interface.
- (9) Authenticated carriers should only give access to the web service to duly authorised staff.
- (10) This Regulation should provide for data protection and security rules applicable to the authentication scheme.
- (11) In order to ensure that the verification query is based on information, which is as up-to-date as possible, queries should be introduced at the earliest 48 hours prior to the scheduled time of departure.
- (12) This Regulation should apply to air carriers, sea carriers and international carriers transporting groups overland by coach, coming into the territory of the Member States. Border checks for entry into the territory of the Member States may precede boarding. In such cases, carriers should be relieved of the obligation to verify the travel authorisation status of travellers.
- (13) Carriers should have access to a web form on a public website allowing them to request assistance. When requesting assistance carriers should receive an acknowledgement of receipt containing a ticket number. eu-LISA or the ETIAS Central Unit may contact carriers that have received a ticket by any means necessary, including by phone, in order to provide an adequate response.
- (14) Due to the need to limit the administrative burden on passenger travel and carrier to the extent possible by integrating with the European Travel Information and Authorisation System and therefore adapting the conditions for the operation of the web service referred to in Article 13 of Regulation (EU) 2017/2226 to the adoption of Regulation (EU) 2018/1240, the provisions on assistance to carriers and the procedures to follow in case of technical impossibility established for Regulation (EU) 2018/1240 should apply.
- (15) This Regulation is without prejudice to the application of Directive 2004/38/EC of the European Parliament and of the Council ⁽⁴⁾.
- (16) In accordance with Articles 1 and 2 of Protocol No 22 on the position of Denmark, annexed to the Treaty on European Union and to the Treaty on the Functioning of the European Union, Denmark did not take part in the adoption of Regulation (EU) 2017/2226 and is not bound by it or subject to its application. However, given that Regulation (EU) 2017/2226 builds upon the Schengen *acquis*, Denmark, in accordance with Article 4 of that Protocol, notified on 30 May 2018 its decision to implement Regulation (EU) 2017/2226 in its national law. Denmark is therefore bound under international law to implement this Regulation.
- (17) This Regulation constitutes a development of the provisions of the Schengen *acquis* in which Ireland does not take part ⁽⁵⁾. Ireland is therefore not taking part in the adoption of this Regulation and is not bound by it or subject to its application.

⁽⁴⁾ Directive 2004/38/EC of the European Parliament and of the Council of 29 April 2004 on the right of citizens of the Union and their family members to move and reside freely within the territory of the Member States amending Regulation (EEC) No 1612/68 and repealing Directives 64/221/EEC, 68/360/EEC, 72/194/EEC, 73/148/EEC, 75/34/EEC, 75/35/EEC, 90/364/EEC, 90/365/EEC and 93/96/EEC (OJ L 158, 30.4.2004, p. 77).

⁽⁵⁾ This Regulation falls outside the scope of the measures provided for in Council Decision 2002/192/EC of 28 February 2002 concerning Ireland's request to take part in some of the provisions of the Schengen *acquis* (OJ L 64, 7.3.2002, p. 20).

- (18) As regards Iceland and Norway, this Regulation constitutes a development of the provisions of the Schengen *acquis* within the meaning of the Agreement concluded by the Council of the European Union and the Republic of Iceland and the Kingdom of Norway concerning the association of those two States with the implementation, application and development of the Schengen *acquis* ⁽⁶⁾, which fall within the area referred to in Article 1, point A of Council Decision 1999/437/EC ⁽⁷⁾.
- (19) As regards Switzerland, this Regulation constitutes a development of the provisions of the Schengen *acquis* within the meaning of the Agreement between the European Union, the European Community and the Swiss Confederation on the Swiss Confederation's association with the implementation, application and development of the Schengen *acquis* ⁽⁸⁾, which fall within the area referred to in Article 1, point A of Decision 1999/437/EC, read in conjunction with Article 3 of Council Decision 2008/146/EC ⁽⁹⁾.
- (20) As regards Liechtenstein, this Regulation constitutes a development of the provisions of the Schengen *acquis* within the meaning of the Protocol between the European Union, the European Community, the Swiss Confederation and the Principality of Liechtenstein on the accession of the Principality of Liechtenstein to the Agreement between the European Union, the European Community and the Swiss Confederation on the Swiss Confederation's association with the implementation, application and development of the Schengen *acquis* ⁽¹⁰⁾ which fall within the area referred to in Article 1, point A of Decision 1999/437/EC read in conjunction with Article 3 of Council Decision 2011/350/EU ⁽¹¹⁾.
- (21) As regards Bulgaria and Romania, as the verification in accordance with applicable Schengen evaluation procedures has been successfully completed, as confirmed by Council conclusions of 9 June 2011; the provisions of the Schengen *acquis* relating to the Schengen Information System have been put into effect by Council Decision (EU) 2018/934 ⁽¹²⁾ on the putting into effect of the remaining provisions of the Schengen *acquis* relating to the Schengen Information System in the Republic of Bulgaria and Romania; the provisions of the Schengen *acquis* relating to the Visa Information System have been put into effect by Council Decision (EU) 2017/1908 ⁽¹³⁾ on the putting into effect of certain provisions of the Schengen *acquis* relating to the Visa Information System in the Republic of Bulgaria and Romania, all the conditions for the operation of the Entry/Exit System set out in Article 66(2)(b) of Regulation (EU) 2017/2226 are met and those Member States should therefore operate the Entry/Exit System from the start of operations as decided in accordance with Article 66(1) of Regulation (EU) 2017/2226.
- (22) As regards Cyprus and Croatia, the operation of the Entry/Exit System requires the granting of passive access to the Visa Information System and the putting into effect of all the provisions of the Schengen *acquis* relating to the Schengen Information System in accordance with the relevant Council Decisions. Those conditions can only be met once the verification in accordance with the applicable Schengen evaluation procedure has been successfully completed. Therefore, the Entry/Exit System should be operated only by those Member States which fulfil those

⁽⁶⁾ OJ L 176, 10.7.1999, p. 36.

⁽⁷⁾ Council Decision 1999/437/EC of 17 May 1999 on certain arrangements for the application of the Agreement concluded by the Council of the European Union and the Republic of Iceland and the Kingdom of Norway concerning the association of those two States with the implementation, application and development of the Schengen *acquis* (OJ L 176, 10.7.1999, p. 31).

⁽⁸⁾ OJ L 53, 27.2.2008, p. 52.

⁽⁹⁾ Council Decision 2008/146/EC of 28 January 2008 on the conclusion, on behalf of the European Community, of the Agreement between the European Union, the European Community and the Swiss Confederation on the Swiss Confederation's association with the implementation, application and development of the Schengen *acquis* (OJ L 53, 27.2.2008, p. 1).

⁽¹⁰⁾ OJ L 160, 18.6.2011, p. 21.

⁽¹¹⁾ Council Decision 2011/350/EU of 7 March 2011 on the conclusion, on behalf of the European Union, of the Protocol between the European Union, the European Community, the Swiss Confederation and the Principality of Liechtenstein on the accession of the Principality of Liechtenstein to the Agreement between the European Union, the European Community and the Swiss Confederation on the Swiss Confederation's association with the implementation, application and development of the Schengen *acquis*, relating to the abolition of checks at internal borders and movement of persons (OJ L 160, 18.6.2011, p. 19).

⁽¹²⁾ Council Decision (EU) 2018/934 of 25 June 2018 on the putting into effect of the remaining provisions of the Schengen *acquis* relating to the Schengen Information System in the Republic of Bulgaria and Romania (OJ L 165, 2.7.2018, p. 37).

⁽¹³⁾ Council Decision (EU) 2017/1908 of 12 October 2017 on the putting into effect of certain provisions of the Schengen *acquis* relating to the Visa Information System in the Republic of Bulgaria and Romania (OJ L 269, 19.10.2017, p. 39).

conditions at the start of the operation of the Entry/Exit System. Member States not operating the Entry/Exit System from the start of operations should be connected to the Entry/Exit System, in accordance with the procedure set out in Regulation (EU) 2017/2226, as soon as all of those conditions are met.

- (23) The European Data Protection Supervisor was consulted in accordance with Article 42(1) of Regulation (EU) 2018/1725 of the European Parliament and of the Council ⁽¹⁴⁾ and delivered an opinion on 29 April 2021.
- (24) The measures provided for in this Regulation are in accordance with the opinion of the Smart Borders Committee (EES),

HAS ADOPTED THIS REGULATION:

Article 1

Subject matter

This Regulation establishes:

- (a) the detailed rules and conditions for the operation of the web service and the data protection and security rules applicable to the web service provided for in Article 13(1) and (3) and Article 36, first paragraph, point (h), of Regulation (EU) 2017/2226;
- (b) an authentication scheme for carriers to enable them to fulfil their obligations pursuant to Article 13(3) of Regulation (EU) 2017/2226 as well as detailed rules and conditions on registration of carriers in order to gain access to the authentication scheme;
- (c) details of the procedures to be followed where it is technically impossible for carriers to access the web service.

Article 2

Definitions

For the purposes of this Regulation the following definitions apply:

- (1) 'carrier interface' means the web service to be developed by eu-LISA in accordance with Article 37(1) of Regulation (EU) 2017/2226 where used for the purposes of Article 13(3) of that Regulation and consisting of an IT interface connected to a read only database;
- (2) 'technical guidelines' means the part of the technical specifications, referred to in Article 37(1) of Regulation (EU) 2017/2226 that is relevant for carriers for the implementation of the authentication scheme and the development of the message format of the Application Programming Interface referred to in Article 4(2)(a);
- (3) 'duly authorised staff' means natural persons that are employees of or contractually engaged by the carrier or other legal or natural under that carrier's direction or supervision, assigned with the tasks of verifying whether the number of entries authorised by a visa has already been used on behalf of the carrier, in accordance with Article 13(3) of Regulation (EU) 2017/2226.

⁽¹⁴⁾ Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC (OJ L 295, 21.11.2018, p. 39).

*Article 3***Obligations of carriers**

1. Carriers shall launch a query to verify whether the number of entries authorised by a visa has already been used as referred to in Article 13 of Regulation (EU) 2017/2226 ('verification query') through the carrier interface.
2. The verification query shall be introduced at the earliest 48 hours prior to the scheduled time of departure.
3. Carriers shall ensure that only duly authorised staff have access to the carrier interface. The carriers shall put in place at least the following mechanisms:
 - (a) physical and logical access control mechanisms to prevent unauthorised access to the infrastructure or the systems used by the carriers;
 - (b) authentication;
 - (c) logging to ensure access traceability;
 - (d) regular review of the access rights.

*Article 4***Connection and access to the carrier interface**

1. Carriers shall connect to the carrier interface through one of the following:
 - (a) a dedicated network connection;
 - (b) an internet connection.
2. Carriers shall access the carrier interface through one of the following:
 - (a) a system to system interface (Application Programming Interface);
 - (b) a web interface (browser);
 - (c) an application for mobile devices.

*Article 5***Queries**

1. In order to send a verification query, the carrier shall provide the following traveller data:
 - (a) surname (family name); first name or names (given names);
 - (b) date of birth; sex; nationality;
 - (c) the type and number of the travel document and the three letter code of the issuing country of the travel document;
 - (d) the date of expiry of the validity of the travel document;
 - (e) the scheduled date of arrival at the border of a Member State which applies the Schengen *acquis* in full or a Member State which does not apply the Schengen *acquis* in full but operates the Entry/Exit system;
 - (f) one of the following:
 - (1) the scheduled Member State of entry which applies the Schengen *acquis* in full;
 - (2) where possible to identify the scheduled Member State of entry, an airport in the Member State of entry which applies the Schengen *acquis* in full;
 - (3) the scheduled Member State of entry which does not apply the Schengen *acquis* in full but operates the Entry/Exit System;
 - (4) where possible to identify the scheduled Member State of entry, an airport in the Member State of entry which does not apply the Schengen *acquis* in full but operates the Entry/Exit System;

- (g) the details (local date and time of scheduled departure, identification number, where available, or other means to identify the transport) of the means of transportation used to access the territory of a Member State which applies the Schengen *acquis* in full or the Member State which does not apply the Schengen *acquis* in full but operates the Entry/Exit System.
2. Where the itinerary requires a double-entry visa from the traveller, the carrier shall provide information that the itinerary includes two entries into the Member States when submitting the verification query.
3. For the purposes of providing the information referred to in paragraph 1, points (a) to (d), carriers may scan the machine-readable zone of the travel document.
4. Where the passenger is exempt from the scope of Regulation (EU) 2017/2226 in accordance with Article 2 of that Regulation or is in airport transit, the carrier shall be able to specify it in the verification query.
5. Carriers shall be able to send a verification query for one or more passengers. The carrier interface shall include the reply referred to in Article 6 for each passenger included in the query.

Article 6

Reply

1. Where the passenger is exempt from the scope of Regulation (EU) 2017/2226 in accordance with Article 2 of that Regulation, is in airport transit or is a holder of a national short-stay visa in the meaning of Article 3(1), point 10 of that Regulation, the reply shall be 'Not applicable'. In all other cases, the reply shall be 'OK' or 'Not OK'.

Where a verification query returns a 'Not OK' reply, the carrier interface shall specify that the reply is coming from the Entry/Exit System.

2. Replies to verification queries shall be determined in accordance with the following rules:
- (a) where the traveller is the holder of a uniform short-stay visa:
- (i) where the authorised number of entries (one or two) on the visa has not yet been reached: OK;
 - (ii) where the authorised number of entries (one or two) on the visa has already been reached: Not OK;
 - (iii) where the visa has expired, or has been revoked or annulled: Not OK;
- (b) where the traveller is subject to a visa obligation and no visa information is available: Not OK;
- (c) where the carrier specifies that the itinerary requires a double entry visa:
- (i) where the traveller is in possession of a double entry visa, valid for the date of arrival and neither entry has been used: OK;
 - (ii) where the traveller is not in possession of a double entry visa: Not OK;
 - (iii) where the traveller is in possession of a double entry visa but at least one entry has been used: Not OK;
 - (iv) where the traveller is in possession of a double entry visa but at least one entry is not valid for the date of arrival: Not OK.
3. Where the traveller is visa exempt or the traveller falls within the scope of Regulation (EU) 2018/1240, the provisions defined in the Commission Implementing Regulation (EU) 2021/1217 ⁽¹⁵⁾ applies.

⁽¹⁵⁾ Commission Implementing Regulation (EU) 2021/1217 of 26 July 2021 laying down the rules and conditions for verification queries by carriers, provisions for data protection and security for the carriers' authentication scheme as well as fall back procedures in case of technical impossibility (OJ L 267, 27.7.2021, p. 1).

*Article 7***Message format**

eu-LISA shall specify the data formats and structure of messages to be used for transmitting verification queries and replies to those queries through the carrier interface in the technical guidelines. eu-LISA shall include at least the following data formats:

- (a) UN/EDIFACT;
- (b) PAXLST/CUSRES;
- (c) XML;
- (d) JSON.

*Article 8***Data extraction requirements for the carrier interface and the web service for third country nationals and data quality**

1. Data on issued, annulled and revoked short stay visas, and travel authorisations shall be regularly and automatically extracted from the Visa Information System, the European Travel Information and Authorisation System and the Entry/Exit System and transmitted to the read-only database.
2. All extractions of data into the read-only database pursuant to paragraph 1 shall be logged.
3. eu-LISA shall be responsible for the security of the web service and of the personal data it contains, and for the process of extracting and transmitting the data referred to in paragraph 1 to the read-only database.
4. It shall not be possible to transmit data from the read-only database to the Entry/Exit System or the Visa Information System.

*Article 9***Authentication scheme**

1. eu-LISA shall develop an authentication scheme, taking into account information on security risk management and the principles of data protection by design and default and allowing to trace the initiator of the verification query.
2. The details of the authentication scheme shall be set out in the technical guidelines.
3. The authentication scheme shall be tested in accordance with Article 12.
4. Where carriers access the carrier interface using the Application Programming Interface referred to in Article 4(2), point (a), the authentication scheme shall be implemented by means of mutual authentication.

*Article 10***Registration for the authentication scheme**

1. Carriers referred to in Article 13(3) of Regulation (EU) 2017/2226 operating and transporting passengers into the territory of the Member States shall be required to register prior to gaining access to the authentication scheme.
2. eu-LISA shall make available a registration form on a public website to be completed on-line. Submission of the registration form shall only be possible where all the fields have been correctly completed.
3. The registration form shall include fields requiring carriers to provide the following information:
 - (a) the legal name of the carrier as well as its contact details (email address, telephone number and postal address);

- (b) the contact details of the legal representative of the company requesting the registration and of back-up points of contact (names, telephone numbers, email and postal addresses) as well as the functional email address and other means of communication that the carrier intends to use for the purposes of Articles 13 and 14;
 - (c) the Member State or third country that issued the official company registration referred to in paragraph 6 and any available registration number;
 - (d) where the carrier has attached, in accordance with paragraph 6, an official company registration issued by a third country, the Member States in which the carrier operates or intends to operate within the next year.
4. The registration form shall inform the carriers of the minimum security requirements, which shall ensure compliance with the following objectives:
- (a) identifying and managing security risks related to the connection to the carrier interface;
 - (b) protecting the environments and the devices connected to the carrier interface;
 - (c) detecting, analysing, responding to and recovering from cyber security incidents.
5. The registration form shall require carriers to declare:
- (a) that they operate and transport passengers into the territory of the Member States or intend to do so within the next six months;
 - (b) that they will access and make use of the carrier interface in accordance with the minimum security requirements set out in the registration form, in accordance with paragraph 4;
 - (c) that only duly authorised staff will have access to the carrier interface.
6. The registration form shall require carriers to attach an electronic copy of their instruments of constitution, including statutes, as well as an electronic copy of an extract of their official company registration from either at least one Member State, where applicable, or from a third country in, or officially translated into, one of the official Union or one of the Schengen Associated Countries languages. An electronic copy of an authorisation to operate in one or more Member States, such as an Air Operator Certificate, can substitute the official company registration.
7. The registration form shall notify carriers:
- (a) that they are required to inform eu-LISA of any changes regarding the information referred to in paragraphs 3, 4 and 5 or in case of technical changes affecting their 'system to system' connection to the carrier interface that may require additional testing in accordance with Article 12 through specified contact details of eu-LISA to be used for this purpose;
 - (b) that they will be automatically deregistered from the authentication scheme if the logs show that the carrier has not used the carrier interface during a period of one year;
 - (c) that they may be deregistered from the authentication scheme in case of a breach of the provisions of this Regulation, the security requirements referred to in paragraph 4 or the technical guidelines, including in case of abuse of the carrier interface;
 - (d) that they are obliged to inform eu-LISA of any personal data breach that may occur and regularly review the access rights of their dedicated staff.
8. Where the registration form has been submitted correctly, eu-LISA shall register the carrier and notify the carrier that it has been registered. Where the registration form has not been submitted correctly, eu-LISA shall refuse registration and notify the carrier of the reasons.

Article 11

Deregistration from the authentication scheme

1. Where a carrier informs eu-LISA that it no longer operates or transports passengers into the territory of the Member States, eu-LISA shall deregister the carrier.
2. Where the logs show that the carrier has not used the carrier interface during a period of one year, it shall be automatically deregistered.

3. Where a carrier no longer fulfils the conditions referred to in Article 10(5), or has otherwise breached the provisions of this Regulation, the security requirements referred to in Article 10(4) or the technical guidelines, including in case of abuse of the carrier interface, eu-LISA may deregister the carrier.
4. eu-LISA shall inform the carrier of its intention to deregister the carrier pursuant to paragraphs 1, 2 or 3, together with the reason for the deregistration, one month before deregistration. Before deregistration, eu-LISA shall give the carrier the opportunity to provide written comments.
5. In case of urgent IT security concerns, including where the carrier is not complying with the security requirements referred to in Article 10(4) or with the technical guidelines, eu-LISA may immediately disconnect a carrier. eu-LISA shall inform the carrier of the disconnection, together with the reason for the disconnection.
6. To the extent appropriate, eu-LISA shall assist carriers that have received a notice of deregistration or disconnection to remedy the deficiencies that gave rise to the notice and, where possible, for a limited time and under strict conditions, provide the opportunity for disconnected carriers to send verification queries by other means than those referred to in Article 4.
7. Disconnected carriers may again be connected to the carrier interface following successful removal of the security concerns that gave rise to the disconnection. Deregistered carriers may submit a new request for registration.
8. eu-LISA shall maintain an up to date register of registered carriers. Personal data contained in the registration of carriers shall be deleted at the latest one year after the carrier has been deregistered. At any time following the registration of carriers pursuant to Article 10, eu-LISA may, in particular where there is reasoned suspicion that one or more carriers are abusing the carrier interface or do not fulfil the conditions referred to in Article 10(4), make inquiries with Member States or third countries.
9. Where the registration form referred to in Article 10(2) is not available for a prolonged period of time, eu-LISA shall ensure that registration in accordance with that Article is possible via other means.

Article 12

Development, testing and connection of the carrier interface

1. eu-LISA shall make the technical guidelines available to carriers in order to enable them to develop and test the carrier interface.
2. Where carriers choose to connect through the Application Programming Interface referred to in Article 4(2), point (a), the implementation of the message format referred to in Article 7 and of the authentication scheme referred to in Article 9 shall be tested.
3. Where carriers choose to connect through the web interface (browser) or application for mobile devices referred to in Article 4(2), points (b) and (c) respectively, they shall notify eu-LISA that they have successfully tested their connection to the carrier interface and that their duly authorised staff has been successfully trained in using the carrier interface.
4. For the purpose of paragraph 2, eu-LISA shall develop and make available a testing plan, a test environment and a simulator allowing eu-LISA and carriers to test the carriers' connection to the carrier interface. For the purpose of paragraph 3, eu-LISA shall develop and make available a test environment allowing carriers to train their staff.
5. Upon successful completion of the registration procedure referred to in Article 10 as well as the successful completion of the testing referred to in paragraph 2 or reception of the notification referred to in paragraph 3, eu-LISA shall connect the carrier to the carrier interface.

*Article 13***Technical impossibility to proceed with verification queries**

Where it is technically impossible to send a verification query because a component of the Entry/Exit System failed, Article 13 of Implementing Regulation (EU) 2021/1217 shall apply, *mutatis mutandis*, in the event of a technical impossibility to proceed with a verification query due to a failure of any component of the Entry/Exit System.

*Article 14***Assistance to carriers**

In order to allow carriers to request assistance, Article 14 of Implementing Regulation (EU) 2021/1217 shall apply, *mutatis mutandis*, with regard to requests for assistance by carriers in relation to the Entry/Exit System.

*Article 15***Access to the web service by third country nationals**

1. When verifying the remaining days of authorised stay via a secure internet access to the web service, third country nationals shall indicate the Member State of destination.
2. The third country national shall insert the following data in the web service:
 - (a) type and number of the travel document or documents and three-letter code of the issuing country of the travel document or documents;
 - (b) optionally, intended date of entry or exit or both, set as Central European Time by default, editable by the user;
 - (c) Member State of destination.
3. The web service shall provide one of the following replies:
 - (a) 'OK' and the remaining days of authorised stay;
 - (b) 'NOT OK' and 0 remaining days of authorised stay;
 - (c) 'Not available'.
4. Where the number of remaining days of authorised stay is provided, the web service shall indicate that the number of days was calculated on the basis of the intended date of entry provided by the third country national and that the actual number of days remaining may vary depending on the actual date of entry. Where no intended date of entry has been provided by the third country national, the remaining authorised stay will be calculated on the basis of the calendar date of the query. In this case, the web service shall indicate that the number of days remaining for authorised stay was calculated on the basis of the calendar date of the query.
5. During the transitional period provided for in Article 22 of Regulation (EU) 2017/2226, where no data exist in the Entry/Exit System for the third country national, replies to the verification queries shall be determined in accordance with the following rules:
 - (a) Authorised stay: OK;
 - (b) Remaining days: information not available, including a note stating that the stays that occurred before the Entry/Exit System started operations have not been taken into account.
6. After the transitional period provided for in Article 22 of Regulation (EU) 2017/2226, replies to the verification queries shall be determined in accordance with the following rules:
 - (a) where the third country national has sufficient remaining days of authorised stay, the reply shall be:
 - (i) Authorised stay: OK;
 - (ii) Remaining days: remaining days of authorised stay calculated by the Entry/Exit System;

- (b) where the third country national has consumed part of the authorised stay and intends to stay longer than the authorised stay, the reply shall be:
 - (i) Authorised stay: NOT OK;
 - (ii) Remaining days: 0;
 - (c) where the third country national has consumed all the days of the authorised stay, the reply shall be:
 - (i) Authorised stay: NOT OK;
 - (ii) Remaining days: 0;
 - (d) where the third country national is subject to a visa obligation and has no valid visa or the visa has expired, or has been revoked or annulled, or has a limited territorial validity visa which does not match the inserted Member State of destination, the reply shall be:
 - (i) Authorised stay: NOT OK;
 - (ii) Remaining days: 0;
 - (e) where the third country national is not subject to a visa obligation and has no valid travel authorisation or has a travel authorisation that has expired, or has been revoked or annulled, the reply shall be:
 - (i) Authorised stay: NOT OK;
 - (ii) Remaining days: 0;
 - (f) where there are no entries in the Entry/Exit System for a third country national who is a holder of a short stay visa, the number of remaining days shall be capped according to the expiration date of the short stay visa. In the case of visa exempt third country nationals, after start of operations of the European Travel Information and Authorisation System, the number of remaining days shall be capped according to the expiration date of the travel authorisation, taking into account the transitional period and grace period referred to in Article 83 of Regulation (EU) 2018/1240.
7. The web service shall provide additional information to the third country national as follows:
- (a) in a prominent place, the Member States for which the calculation of the stay is applicable;
 - (b) close to the field to enter the travel document number, that the travel document to be used for the purposes of the web service shall be one of the travel documents used for previous stays;
 - (c) the list of Member States;
 - (d) all possible reasons for receiving the reply: 'Information not available';
 - (e) a general disclaimer stating clearly that the answer 'OK/NOT OK' cannot be interpreted as a decision to grant or refuse entry to the Schengen area;
 - (f) the regime applicable to third country nationals who are members of the family of a Union citizen to whom Directive 2004/38/EC applies or of a national of a third country enjoying the right of free movement equivalent to that of Union citizens under an agreement between the Union and its Member States, on the one hand, and a third country, on the other and do not hold a residence card pursuant to Directive 2004/38/EC or a residence permit pursuant to Regulation (EC) No 1030/2002.

Article 16

Repeal of Implementing Decision C(2019) 1230

The Implementing Decision C(2019) 1230 shall be repealed.

*Article 17***Entry into force and applicability**

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States in accordance with the Treaties.

Done at Brussels, 27 July 2021.

For the Commission

The President

Ursula VON DER LEYEN

COMMISSION IMPLEMENTING REGULATION (EU) 2021/1225**of 27 July 2021****specifying the arrangements for the data exchanges pursuant to Regulation (EU) 2019/2152 of the European Parliament and of the Council and amending Commission Implementing Regulation (EU) 2020/1197, as regards the Member State of extra-Union export and the obligations of reporting units****(Text with EEA relevance)**

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) 2019/2152 of the European Parliament and of the Council on European business statistics, repealing 10 legal acts in the field of business statistics ⁽¹⁾, and in particular Articles 5(5) and 7(1) thereof,

Whereas:

- (1) It is necessary to specify the arrangements for the data exchange of statistical information related to exports and imports of goods to be provided by the customs and tax authorities of each Member State to the competent National Statistical Authorities (NSAs).
- (2) Regulation (EU) 2019/2152 sets out the exchange of microdata from customs declarations between the NSAs of the Member States for statistical purposes, in order to produce harmonised statistics on international trade in goods and to improve the quality of those statistics. It is necessary to specify the arrangements for this exchange of microdata between the NSAs, to define its scope, to list the microdata to be exchanged and to establish the format, the security measures and the procedure for exchanging these data.
- (3) It is necessary to amend Commission Implementing Regulation (EU) 2020/1197 ⁽²⁾ as regards the first reference period for the application of the definition of the Member State of extra-Union export, deferring its application by two years. This is to ensure that NSAs are capable of identifying goods in quasi-export and determining the Member State of actual export coherently, with the help of the microdata to be exchanged, and to enable NSAs to assure the quality of the statistics produced.
- (4) It is also necessary to amend Implementing Regulation (EU) 2020/1197 as regards the obligations of importers and exporters to assist NSAs in clarifying data quality issues.
- (5) The measures provided for in this Regulation are in accordance with the opinion of the European Statistical System Committee, established by Article 7 of Regulation (EC) No 223/2009 of the European Parliament and of the Council ⁽³⁾,

⁽¹⁾ OJ L 327, 17.12.2019, p. 1.

⁽²⁾ Commission Implementing Regulation (EU) 2020/1197 of 30 July 2020 laying down technical specifications and arrangements pursuant to Regulation (EU) 2019/2152 of the European Parliament and of the Council on European business statistics repealing 10 legal acts in the field of business statistics (OJ L 271, 18.8.2020, p. 1).

⁽³⁾ Regulation (EC) No 223/2009 of the European Parliament and of the Council of 11 March 2009 on European statistics and repealing Regulation (EC, Euratom) No 1101/2008 of the European Parliament and of the Council on the transmission of data subject to statistical confidentiality to the Statistical Office of the European Communities, Council Regulation (EC) No 322/97 on Community Statistics, and Council Decision 89/382/EEC, Euratom establishing a Committee on the Statistical Programmes of the European Communities (OJ L 87, 31.3.2009, p. 164).

HAS ADOPTED THIS REGULATION:

Article 1

Subject matter

This Regulation specifies the arrangements for the data exchanges between customs authorities and national statistical authorities (NSAs), and for the data exchanges between tax authorities and NSAs. It also specifies the arrangements for the exchange of microdata from customs declarations related to exports and imports of goods between the NSAs.

Article 2

Definitions

For the purposes of this Regulation, the following definitions shall apply:

- (a) 'centralised clearance in the transitional period' means centralised clearance within the meaning of Article 179 of Regulation (EU) No 952/2013 of the European Parliament and of the Council ^(*), which involves customs authorities of more than one Member State, and where the means of exchange of information between the customs authorities is set out by Article 18 of Commission Delegated Regulation (EU) 2016/341 ^(²);
- (b) 'sending Member State' means the Member State where the customs declaration is lodged, where the records from customs declarations refer to centralised clearance in the transitional period or to goods in quasi-export;
- (c) 'receiving Member State' means the Member State that obtains microdata from the sending Member State.

Article 3

Data exchange arrangements between customs authorities and NSAs

1. The records from customs declarations, as referred to in point (c) of Annex VI of Regulation (EU) 2019/2152, shall be provided by customs authorities to their NSAs without delay and, at the latest, during the month following the month in which the customs declarations were accepted or were subject to decisions by customs pertaining to them.
2. Where the records from provided customs declarations are amended or changed, the customs authorities shall provide their NSAs with revised information.
3. The customs authorities shall verify, at the request of their NSAs, the correctness and completeness of the records from customs declarations provided by them.

Article 4

Data exchange arrangements between tax authorities and national statistical authorities

1. The information referred to in Annex V of Regulation (EU) 2019/2152 shall be provided by tax authorities to their NSAs upon receipt of the information and, at the latest, during the month following the month in which the information became available.

^(*) Regulation (EU) No 952/2013 of the European Parliament and of the Council of 9 October 2013 laying down the Union Customs Code (OJ L 269, 10.10.2013, p. 1).

^(²) Commission Delegated Regulation (EU) 2016/341 of 17 December 2015 supplementing Regulation (EU) No 952/2013 of the European Parliament and of the Council as regards transitional rules for certain provisions of the Union Customs Code where the relevant electronic systems are not yet operational and amending Delegated Regulation (EU) 2015/2446 (OJ L 69, 15.3.2016, p. 1).

2. Where the information provided by tax authorities is amended or changed, the tax authorities shall provide their NSAs with revised information.
3. The tax authorities shall verify, at the request of their NSAs, the correctness and completeness of the information provided by them.

Article 5

Arrangements for exchange of microdata from customs declarations between Member States for statistical purposes

1. Where the records from customs declarations refer to centralised clearance in the transitional period or to goods in quasi-export, the NSA of the sending Member State shall provide, to the NSA of the receiving Member State, the microdata related to the exports or imports of goods provided by the customs authority of the sending Member State.
2. Where the records from customs declarations refer to centralised clearance in the transitional period, the receiving Member State shall be the Member State in the statistical territory of which the goods are located at the time of release into the customs procedure or at the time of re-export.
3. Where the records from customs declarations refer to goods in quasi-export, as referred to in Annex V, Section 1 (l) of Regulation (EU) 2020/1197, the receiving Member State shall be the Member State of actual export, as referred to in Annex V, Section 17(2), second subparagraph of Regulation (EU) 2020/1197.
4. The microdata referred to in paragraph 1 shall include:
 - (a) where the records from customs declarations refer to imports under centralised clearance in the transitional period, the microdata as set out in column C1 of the Annex;
 - (b) where the records from customs declarations refer to exports under centralised clearance in the transitional period, the microdata as set out in column C2 of the Annex;
 - (c) where the records from customs declarations refer to goods in quasi-export, the microdata as set out in column C3 of the Annex.
5. The NSA of the sending Member State shall provide, to the NSA of the receiving Member State, the metadata relevant for the use of microdata exchanged in the compilation of statistics.
6. Paragraphs 1 to 5 shall not apply where the sending Member State is the Member State of actual export, as referred to in Section 17(2) second subparagraph of Annex V of Regulation (EU) 2020/1197.

Article 6

Timetable for the exchange of microdata between Member States

1. The NSA of the sending Member State shall provide, to the NSA of the receiving Member State, the microdata referred to in Article 5 at the latest 30 calendar days after the end of the reference month.
2. Where additional, amended or changed records from customs declarations become available to the NSA of the sending Member State after the deadline referred to in paragraph 1, the NSA of the sending Member State shall provide, to the NSA of the receiving Member State, the revised microdata as soon as possible and, at the latest, 30 calendar days after the end of the month in which the additional, amended or changed records from customs declarations became available.

*Article 7***Security measures**

In accordance with Article 10(2) of Commission Decision (EU, Euratom) 2015/443 ⁽⁶⁾, in order to be entitled to receive microdata and metadata in accordance with Article 5 of this Regulation, the NSAs receiving or processing this microdata and metadata in the receiving Member State must ensure that their IT systems are protected at a level equivalent to the Commission's communication and information systems security policy, as set out in Commission Decision (EU, Euratom) 2017/46 ⁽⁷⁾, its implementing rules and corresponding security standards.

*Article 8***Data protection**

With regard to the processing of personal data, the NSAs shall carry out their tasks for the purposes of this Regulation in accordance with Regulation (EU) 2016/679 of the European Parliament and of the Council ⁽⁸⁾.

With regard to the processing of personal data by the Commission (Eurostat), it shall comply with Regulation (EU) 2018/1725 of the European Parliament and of the Council ⁽⁹⁾.

*Article 9***Format of the microdata and metadata exchanged and procedure for the exchange**

1. The microdata and metadata exchanged in accordance with Article 5 shall be exchanged in electronic form and transmitted or uploaded through the Commission's (Eurostat's) single entry point for microdata and, where appropriate, for metadata.
2. Member States should implement the exchange standards in accordance with the implementation guidelines supplied by the Commission (Eurostat).

*Article 10***Amendment to Implementing Regulation (EU) 2020/1197**

Implementing Regulation (EU) 2020/1197 is amended as follows:

- (a) in Annex V, Section 2(2), point (a) is replaced by the following:

‘(a) ‘Member State of extra-Union export’ means the Member State in the statistical territory of which the goods are located at the time of release into the customs procedure or at the time of re-export.

However, in the case of goods in quasi-export, if the ‘Member State of actual export’ as specified in the second subparagraph of Section 17(2) of this Annex can be determined, the ‘Member State of extra-Union export’ from reference period January 2024 onwards shall be the Member State of actual export.’;

⁽⁶⁾ Commission Decision (EU, Euratom) 2015/443 of 13 March 2015 on Security in the Commission (OJ L 72, 17.3.2015, p. 41).

⁽⁷⁾ Commission Decision (EU, Euratom) 2017/46 of 10 January 2017 on the security of communication and information systems in the European Commission (OJ L 6, 11.1.2017, p. 40).

⁽⁸⁾ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (OJ L 119, 4.5.2016, p. 1).

⁽⁹⁾ Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC (OJ L 295, 21.11.2018, p. 39).

(b) in Annex V, Section 8(3) is replaced by the following:

- ‘3. The importer in the Member State of import or the exporter in the Member State of export shall be obliged to assist the NSA in the Member State of import or in the Member State of export, respectively, in clarifying data quality issues related to statistical information, exclusively for the purpose of quality assurance of the data on international trade in goods.’

Article 11

Entry into force

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

It shall apply from 1 January 2022.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 27 July 2021.

For the Commission

The President

Ursula VON DER LEYEN

ANNEX

Microdata to be exchanged

Items marked 'M' are mandatory, items marked 'C' are mandatory if available in the national customs system and items marked 'O' are optional. Items marked '-' are not applicable.

A	B	C1	C2	C3
	Microdata to be exchanged ⁽¹⁾	Centralised clearance imports	Centralised clearance exports	Goods in quasi- export
Group 1 – General				
1.1.	Date of acceptance of the customs declaration	C	C	C
1.2.	Reference period	M	M	M
1.3.	Flow	M	M	M
1.4.	Applied customs data annex	M	M	M
1.5.	Receiving Member State	M	M	M
1.6.	Declaration type	C	C	C
1.7.	Additional declaration type	C	C	C
1.8.	Procedure	C	C	C
1.9.	Additional procedures	C	C	C
1.10.	Authorisation number of the holder of the authorisation	C	C	-
Group 2 – Measurement units				
2.1.	Statistical value	C	C	C
2.2.	Net mass	C	C	C
2.3.	Supplementary units	C	C	C
Group 3 – Breakdowns				
3.1.	Goods code at TARIC level (10-digit code)	C	-	-
3.2.	Goods code at CN level (8-digit code)	-	C	C
3.3.	Country of origin code	C	-	-
3.4.	Country of preferential origin code	C	-	-
3.5.	Country of dispatch/export code [Country of consignment]	C	-	-
3.6.	Country of destination code [Country of last known destination]	-	C	C
3.7.	Country of destination code [Member State of presumed destination]	C	-	-
3.8.	Country of dispatch/export code [Member State of actual export]	-	-	C
3.9.	Nature of transaction	C	C	C
3.10.	Preference	C	-	-

A	B	C1	C2	C3
	Microdata to be exchanged ⁽¹⁾	Centralised clearance imports	Centralised clearance exports	Goods in quasi- export
3.11.	Container	C	C	C
3.12.	Mode of transport at the border	C	C	C
3.13.	Internal mode of transport	C	C	C
3.14.	Invoice currency	C	C	C
Group 4 – Parties				
4.1.	Importer identification number	C	-	-
4.2.	Buyer identification number	C	-	-
4.3.	Consignee identification number ⁽²⁾	C	-	-
4.4.	Exporter identification number		C	C
Group 5 – Optional data				
5.1.	Total amount invoiced	O	O	O
5.2.	Exchange rate	O	-	-
5.3	Delivery terms	O	O	O
5.4	Item amount invoiced	O	-	-

⁽¹⁾ Text in brackets indicates the corresponding statistical data element as specified in Annex V of Regulation (EU) 2020/1197.

⁽²⁾ Only for the customs data requirements under Regulation (EU) 2016/341.

DIRECTIVES

COMMISSION DELEGATED DIRECTIVE (EU) 2021/1226

of 21 December 2020

amending, for the purposes of adapting to scientific and technical progress, Annex II to Directive 2002/49/EC of the European Parliament and of the Council as regards common noise assessment methods

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise ⁽¹⁾, and in particular Article 12 thereof,

Whereas:

- (1) Annex II to Directive 2002/49/EC sets methods of assessment common to the Member States, to be used for the information on environmental noise and its effects on health, in particular for noise mappings, and to adopt action plans based upon noise mapping results. This annex needs to be adapted to technical and scientific progress.
- (2) From 2016 to 2020, the Commission cooperated with technical and scientific experts of the Member States to assess which adaptations were needed taking into account the technical and scientific advances in the calculation of environmental noise. This process was carried out in close consultation with the Noise Expert Group, composed of Member States, the European Parliament, industry stakeholders, public authorities of Member States, NGOs, citizens and academia.
- (3) The Annex to this Delegated Directive sets out the necessary adaptations of the common assessment methods consisting of clarification of formulas to calculate the propagation of noise, adaptation of tables to the latest knowledge and improvements in the description of the steps of the calculations. This affects road noise, railway noise, industrial noise and aircraft noise calculations. Member States are required to use these methods at the latest from 31 December 2021.
- (4) Annex II to Directive 2002/49/EC should therefore be amended accordingly.
- (5) The measures provided for in this Directive are in accordance with the opinion of the Noise Expert Group consulted on 12 October 2020,

HAS ADOPTED THIS DIRECTIVE:

Article 1

Annex II to Directive 2002/49/EC is amended in accordance with the Annex to this Directive.

Article 2

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 31 December 2021 at the latest. They shall immediately communicate the text of those measures to the Commission.

⁽¹⁾ OJ L 189, 18.7.2002, p. 12.

When Member States adopt those measures, they shall contain a reference to this Directive or be accompanied by such a reference on the occasion of their official publication. Member States shall determine how such reference is to be made.

2. Member States shall communicate to the Commission the text of the main provisions of national law which they adopt in the field covered by this Directive.

Article 3

This Directive shall enter into force on the day following that of its publication in the *Official Journal of the European Union*.

Article 4

This Directive is addressed to the Member States.

Done at Brussels, 21 December 2020.

For the Commission
The President
Ursula VON DER LEYEN

ANNEX

Annex II is amended as follows:

- (1) In Section 2.1.1, the second paragraph is replaced by the following:

‘Calculations are performed in octave bands for road traffic, railway traffic and industrial noise, except for the railway noise source sound power, which uses third octave bands. For road traffic, railway traffic and industrial noise, based on these octave band results, the A-weighted long-term average sound level for the day, evening and night period, as defined in Annex I and referred to in Article 5 of Directive 2002/49/EC, is computed by the method described in Sections 2.1.2, 2.2, 2.3, 2.4 and 2.5. For roads and railway traffic in agglomerations, the A-weighted long-term average sound level is determined by the contribution from road and railway segments therein, including major roads and major railways.’

- (2) Section 2.2.1 is amended as follows:

- (a) in the paragraph under the heading ‘Number and Position of Equivalent Sound Sources’, the first sub-paragraph is replaced by the following:

‘In this model, each vehicle (category 1, 2, 3, 4 and 5) is represented by one single point source radiating uniformly. The first reflection on the road surface is treated implicitly. As depicted in Figure [2.2.a], this point source is placed 0,05 m above the road surface.’

- (b) in the paragraph under the heading ‘Sound Power Emission’, the last sub-paragraph under the heading ‘Traffic Flow’ is replaced by the following:

‘The speed v_m is a representative speed per vehicle category: in most cases the lower of the maximum legal speed for the section of road and the maximum legal speed for the vehicle category.’

- (c) in the paragraph under the heading ‘Sound Power Emission’, the first sub-paragraph under the heading ‘Individual vehicle’ is replaced by the following:

‘In the traffic flow, all vehicles of category m are assumed to drive at the same speed, i.e. v_m .’

- (3) Table 2.3.b is amended as follows:

- (a) in the third row, fourth column (called ‘3’), the text is replaced by the following:

‘Represents an indication of the “dynamic” stiffness’;

- (b) in the sixth row, fourth column (called ‘3’), the text is replaced by the following:

H

Hard (800-1 000MN/m).

- (4) Section 2.3.2 is amended as follows:

- (a) in the paragraph under the heading ‘Traffic Flow’, the fourth sub-paragraph, the second indent under formula (2.3.2), is replaced by the following:

‘– v is their speed [km/h] in the j -th track section for vehicle type t and average train speed s ’;

- (b) the paragraph under the headings ‘Squeal’ is replaced by the following:

‘Curve squeal is a special source that is only relevant for curves and is therefore localised. Curve squeal is generally dependent on curvature, friction conditions, train speed, track-wheel geometry and dynamics. As it can be significant, an appropriate description is required. At locations where curve squeal occurs, generally in curves and turnouts of railway switches, suitable excess noise power spectra need to be added to the source power. The excess noise may be specific to each type of rolling stock, as certain wheel and bogie types may be significantly less prone to squeal than others. If measurements of the excess noise are available that take sufficiently the stochastic nature of squeal into account, these may be used.’

If no appropriate measurements are available, a simple approach can be taken. In this approach, squeal noise shall be considered by adding the following excess values to the rolling noise sound power spectra for all frequencies.

Train	5 dB for curves with $300 \text{ m} < R \leq 500 \text{ m}$ and $l_{\text{track}} \geq 50 \text{ m}$ 8 dB for curves with $R \leq 300 \text{ m}$ and $l_{\text{track}} \geq 50 \text{ m}$ 8 dB for switch turnouts with $R \leq 300 \text{ m}$ 0 dB otherwise
Tram	5 dB for curves and switch turnouts with $R \leq 200 \text{ m}$ 0 dB otherwise

where l_{track} is the length of track along the curve and R is the curve radius.

The applicability of these sound power spectra or excess values shall normally be verified on-site, especially for trams and for locations where curves or turnouts are treated with measures against squeal.’;

- (c) the paragraph under the headings ‘Source directivity’, directly after equation (2.3.15) the following is added:

‘Bridge noise is modelled at source A ($h = 1$), for which omni-directionality is assumed.’;

- (d) the paragraph under the headings ‘Source Directivity’, the second sub-paragraph until and including formula 2.3.16 is replaced by the following:

‘The vertical directivity $\Delta L_{W,dir,ver,i}$ in dB is given in the vertical plane for source A ($h = 1$), as a function of the centre band frequency $f_{c,i}$ of each i -th frequency band, and:

for $0 < \psi < \pi/2$ is	(2.3.16)'
$\Delta L_{W,dir,ver,i} = \left(\frac{40}{3} * \left[\frac{2}{3} * \sin(2 * \psi) - \sin(\psi) \right] * \lg \left[\frac{f_{c,i} + 600}{200} \right] \right)$	
for $-\pi/2 < \psi \leq 0$ is	
$\Delta L_{W,dir,ver,i} = 0$	

- (5) In Section 2.3.3, the paragraph under the headings ‘Correction for structural radiation (bridges and viaducts)’ is replaced by the following:

‘Correction for structural radiation (bridges and viaducts)

In the case where the track section is on a bridge, it is necessary to consider the additional noise generated by the vibration of the bridge as a result of the excitation caused by the presence of the train. The bridge noise is modelled as an additional source of which the sound power per vehicle is given by

$L_{W,0,bridge,i} = L_{R,TOT,i} + L_{H,bridge,i} + 10 \times \lg(N_a) \text{ dB}$	(2.3.18)
---	----------

where $L_{H,bridge,i}$ is the bridge transfer function. The bridge noise $L_{W,0,bridge,i}$ represents only the sound radiated by the bridge construction. The rolling noise from a vehicle on the bridge is calculated using (2.3.8) through (2.3.10), by choosing the track transfer function that corresponds to the track system that is present on the bridge. Barriers on the edges of the bridge are generally not taken into account.’.

- (6) Section 2.4.1 is amended as follows:

- (a) in the paragraph under the headings ‘Sound Power Emission – general’, the second sub-paragraph, the whole fourth element of the list including formula (2.4.1) is replaced by the following:

‘— source lines representing moving vehicles are calculated according to formula 2.2.1’;

- (b) the number of the formula (2.4.2) is replaced by the following:

‘(2.4.1)’.

- (7) In Section 2.5.1, the seventh paragraph is replaced by the following:

‘Objects sloping more than 15° in relation to the vertical are not considered as reflectors but taken into account in all other aspects of propagation, such as ground effects and diffraction.’.

- (8) Section 2.5.5 is amended as follows:

- (a) in the paragraph under the headings ‘Sound level in favourable conditions (L_F) for a path (S,R)’, the formula 2.5.6 is replaced by the following:

$A_F = A_{div} + A_{atm} + A_{boundary,F}$	(2.5.6)’
--	----------

- (b) in the paragraph under the headings ‘Long-term sound level at point R in decibels A (dBA)’, the end of the first sub-paragraph below the formula 2.5.11, is replaced by the following:

‘where i is the index of the frequency band. AWC is the A-weighting correction as follows:

Frequency [Hz]	63	125	250	500	1 000	2 000	4 000	8 000
AWC _{f,i} [dB]	-26,2	-16,1	-8,6	-3,2	0	1,2	1,0	-1,1’

- (9) Section 2.5.6 is amended as follows:

- (a) directly below Figure 2.5.b, the following sentence is added:

‘The distances d_n are determined by a 2D projection on the horizontal plane.’;

- (b) the sub-paragraph under the headings ‘Calculation in Favourable Conditions’ is amended as follows:

- (1) the first sentence of point (a) is replaced by the following:

‘In equation 2.5.15 ($A_{ground,H}$) the heights z_s and z_r are replaced by $z_s + \delta z_s + \delta z_T$ and $z_r + \delta z_r + \delta z_T$ respectively where’;

- (2) the first sentence of point (b) is replaced by the following:

‘The lower bound of $A_{ground,F}$ (calculated with unmodified heights) depends on the geometry of the path.’;

- (c) in the paragraph under the heading ‘Diffraction’, the second sub-paragraph is replaced by the following:

‘In practice, the following specifications are considered in the unique vertical plane containing both source and receiver (a flattened Chinese Screen in case of a path including reflections). The direct ray from source to receiver is a straight line under homogeneous propagation conditions and a curved line (arc with radius depending on the length of the straight ray) under favorable propagation conditions.

If the direct ray is not blocked, the edge D is sought which produces the largest path length difference δ (the smallest absolute value because these path length differences are negative). Diffraction is taken into account if:

- this path length difference is larger than $-\lambda/20$, and
- if the “Rayleigh-criterion” is fulfilled.

This is the case, if δ is larger than $\lambda/4 - \delta^*$, where δ^* is the path length difference calculated with this same edge D but related to the mirror source S^* calculated with the mean ground plane at the source side and the mirror receiver R^* calculated with the mean ground plane at the receiver side. To calculate δ^* only the points S^* , D and R^* are taken into account – other edges blocking the path $S^* \rightarrow D \rightarrow R^*$ are neglected.

For the above considerations, the wavelength λ is calculated using the nominal centre frequency and a speed of sound of 340 m/s.

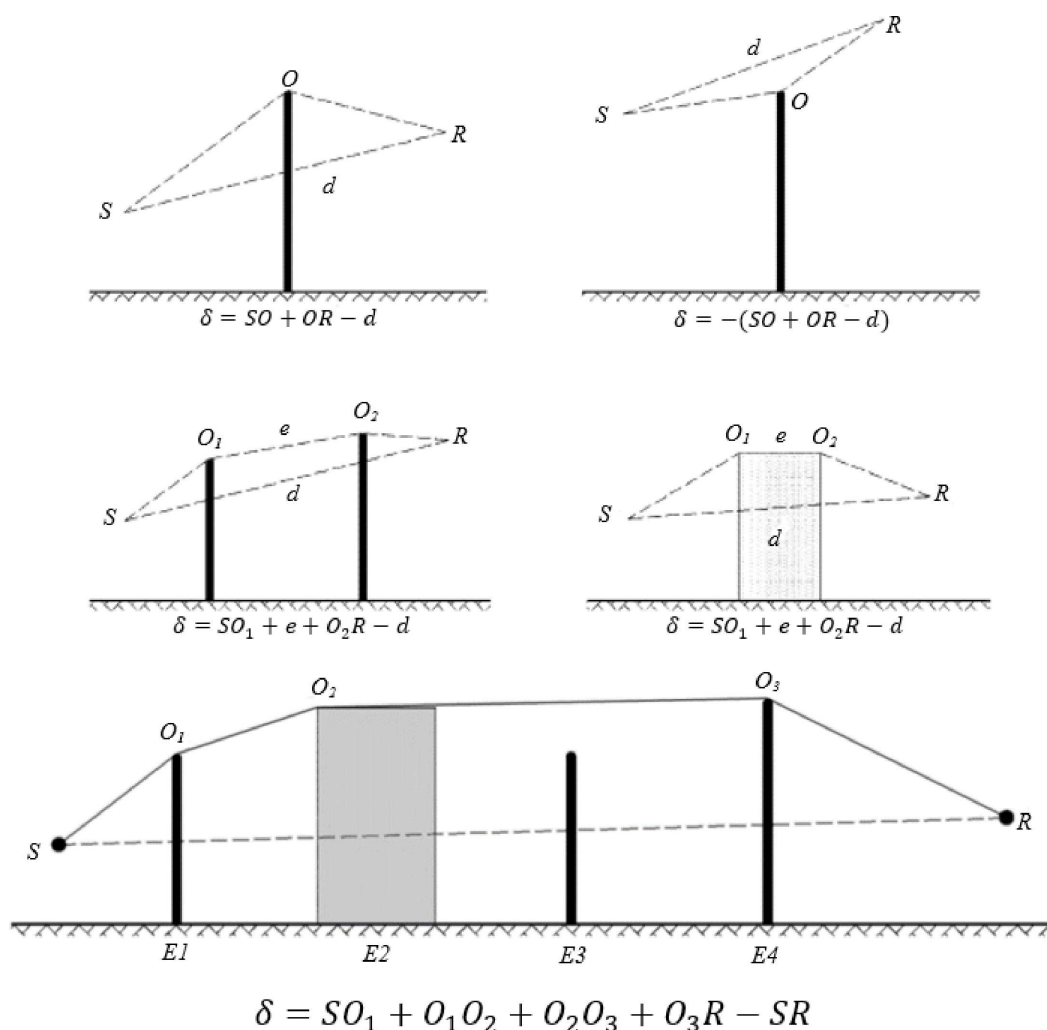
If these two conditions are fulfilled, the edge D separates the source side from the receiver side, two separate mean ground planes are calculated, and A_{dif} is calculated as described in the remainder of this part. Otherwise, no attenuation by diffraction is considered for this path, a common mean ground plane for the path $S \rightarrow R$ is calculated, and A_{ground} is calculated with no diffraction ($A_{\text{dif}} = 0$ dB). This rule applies in both homogeneous and favourable conditions.;

- (d) in the paragraph under the heading 'Pure Diffraction', the second sub-paragraph is replaced by the following:

'For a multiple diffraction, if e is the total path length distance between first and last diffraction point (use curved rays in case of favourable conditions) and if e exceeds 0,3 m (otherwise $C'' = 1$), this coefficient is defined by:

$C'' = \frac{1 + \left(5\lambda/e\right)^2}{1/3 + \left(5\lambda/e\right)^2}$	(2.5.23)'
---	-----------

- (e) the Figure 2.5.d is replaced by the following:



- (f) in the paragraph under the headings 'Favourable Conditions', the first sub-paragraph under Figure 2.5.e is replaced by the following:

'In favourable conditions the three curved sound rays $\widehat{SO}$, $\widehat{OR}$, and $\widehat{SR}$ have an identical radius of curvature Γ defined by:

$\Gamma = \max(1\,000, 8d)$	(2.5.24)
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Where d is defined by the 3D distance between source and receiver of the unfolded path.;

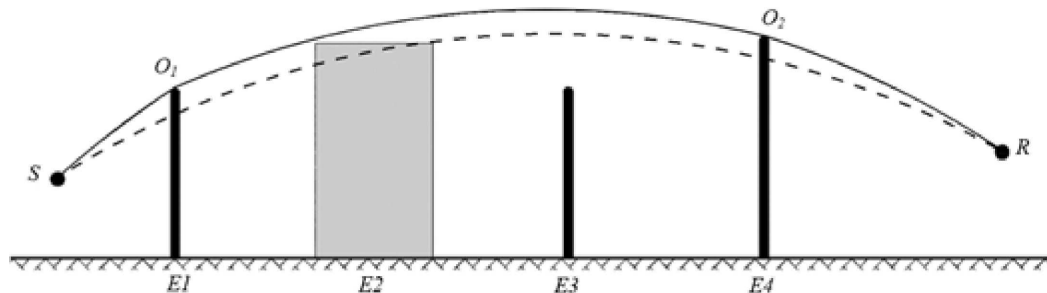
- (g) in the paragraph under the headings 'Favourable Conditions', the sub-paragraphs between formula (2.5.28) and formula (2.5.29) (the two formulas included), are replaced by the following:

$\delta_F = \widehat{SO}_1 + \sum_{i=1}^{n-1} O_i \widehat{O}_{i+1} + \widehat{O}_n R - \widehat{SR}$	(2.5.28)'
---	-----------

Under favourable conditions, the propagation path in the vertical propagation plane always consists of segments of a circle whose radius is given by the 3D-distance between source and receiver, that is to say, all segments of a propagation path have the same radius of curvature. If the direct arc connecting source and receiver is blocked, the propagation path is defined as the shortest convex combination of arcs enveloping all obstacles. Convex in this context means that at each diffraction point, the outgoing ray segment is deflected downward with respect to the incoming ray segment.

Figure 2.5.f

Example of calculation of the path difference in favourable conditions, in the case of multiple diffractions



In the scenario presented in Figure 2.5.f, the path difference is:

$\delta_F = \widehat{SO}_1 + O_1 \widehat{O}_2 + \widehat{O}_2 R - \widehat{SR}$	(2.5.29)'
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- (h) the paragraphs respectively under the headings 'Calculation of the term $\Delta_{\text{ground}(S,O)}$ ' and 'Calculation of the term $\Delta_{\text{ground}(O,R)}$ ' are replaced by the following:

'Calculation of the term $\Delta_{\text{ground}(S,O)}$

$\Delta_{\text{ground}(S,O)} = -20 \times \lg \left(1 + \left(10^{-A_{\text{ground}(S,O)/20} - 1} \right) \cdot 10^{-\left(\Delta_{\text{dif}(S,R)} - \Delta_{\text{dif}(S,O)} \right) / 20} \right)$	(2.5.31)
--	----------

where

- $A_{\text{ground}(S,O)}$ is the attenuation due to the ground effect between the source S and the diffraction point O . This term is calculated as indicated in the previous subsection on calculations in homogeneous conditions and in the previous subsection on calculation in favourable conditions, with the following hypotheses:

- $Z_r = Z_{o,s}$;
- G_{path} is calculated between S and O;
- In homogeneous conditions: $\bar{G}_w = G_{path}$ in Equation (2.5.17), $\bar{G}_m = G_{path}$ in Equation (2.5.18);
- In favourable conditions: $\bar{G}_w = G_{path}$ in Equation (2.5.17), $\bar{G}_m = G'_{path}$ in Equation (2.5.20);
- $\Delta_{dif(S,R)}$ is the attenuation due to the diffraction between the image source S' and R, calculated as in the previous subsection on *Pure diffraction*;
- $\Delta_{dif(S,R)}$ is the attenuation due to the diffraction between S and R, calculated as in the previous subsection on *Pure diffraction*.

In the special case where the source lies below the mean ground plane: $\Delta_{dif(S,R)} = \Delta_{dif(S',R)}$ and $\Delta_{ground(S,O)} = \Delta_{ground(S,O)}$

Calculation of the term $\Delta_{ground(O,R)}$

$\Delta_{ground(O,R)} = -20 \times \lg \left(1 + \left(10^{-\Delta_{ground(O,R)}/20} - 1 \right) \cdot 10^{-(\Delta_{dif(S,R)} - \Delta_{dif(S,R)})/20} \right)$	(2.5.32)
--	----------

where

- $\Delta_{ground(O,R)}$ is the attenuation due to the ground effect between the diffraction point O and the receiver R. This term is calculated as indicated in the previous subsection on calculation in homogeneous conditions and in the previous subsection on calculation in favourable conditions, with the following hypotheses:
 - $Z_s = Z_{o,r}$
 - G_{path} is calculated between O and R.
- The G'_{path} correction does not need to be taken into account here, as the considered source is the diffraction point. Therefore, G_{path} shall indeed be used in the calculation of ground effects, including for the lower bound term of the equation which becomes $-3(1 - G_{path})$.
- In homogeneous conditions, $\bar{G}_w = G_{path}$ in Equation (2.5.17) and $\bar{G}_m = G_{path}$ in Equation (2.5.18).
 - In favourable conditions, $\bar{G}_w = G_{path}$ in Equation (2.5.17) and $\bar{G}_m = G'_{path}$ in Equation (2.5.20).
 - $\Delta_{dif(S,R')}$ is the attenuation due to the diffraction between S and the image receiver R', calculated as in the previous section on pure diffraction.
 - $\Delta_{dif(S,R)}$ is the attenuation due to the diffraction between S and R, calculated as in the previous subsection on pure diffraction.

In the special case where the receiver lies below the mean ground plane: $\Delta_{dif(S,R')} = \Delta_{dif(S,R)}$ and $\Delta_{ground(O,R)} = \Delta_{ground(O,R)}$;

- (i) in Section 2.5.6, the paragraph under the headings 'Vertical Edge Scenarios' is replaced by the following:

'Vertical Edge Scenarios'

Equation (2.5.21) may be used to calculate the diffractions on vertical edges (lateral diffractions) in case of industrial noise. If this is the case, $\Delta_{dif} = \Delta_{dif}(S,R)$ is taken and the term Δ_{ground} is kept. In addition, Δ_{atm} and Δ_{ground} shall be calculated from the total length of the propagation path. Δ_{div} is still calculated from the direct distance d. Equations (2.5.8) and (2.5.6) respectively become:

$A_H = A_{div} + A_{atm}^{path} + A_{ground,H}^{path} + \Delta_{dif,H}(S,R)$	(2.5.33)
--	----------

$A_F = A_{div} + A_{atm}^{path} + A_{ground,F}^{path} + \Delta_{dif,F}(S,R)$	(2.5.34)
--	----------

Δ_{dif} is indeed used in homogeneous conditions in equation (2.5.34).

Lateral diffraction is considered only in cases, where the following conditions are met:

The source is a real point source – not produced by segmentation of an extended source like a line- or area source.

The source is not a mirror source constructed to calculate a reflection.

The direct ray between source and receiver is entirely above the terrain profile.

In the vertical plane containing S and R the path length difference δ is larger than 0, that is to say, the direct ray is blocked. Therefore, in some situations, lateral diffraction may be considered under homogeneous propagation conditions but not under favourable propagation conditions.

If all these conditions are met, up to two laterally diffracted propagation paths are taken into account in addition to the diffracted propagation path in the vertical plane containing source and receiver. The lateral plane is defined as the plane that is perpendicular to the vertical plane and also contains source and receiver. The intersection areas with this lateral plane are constructed from all obstacles that are penetrated by the direct ray from source to receiver. In the lateral plane, the shortest convex connection between source and receiver, consisting of straight segments and encompassing these intersection areas, defines the vertical edges that are taken into account when the laterally diffracted propagation path is constructed.

To calculate ground attenuation for a laterally diffracted propagation path, the mean ground plane between the source and the receiver is calculated taking into account the ground profile vertically below the propagation path. If, in the projection onto a horizontal plane, a lateral propagation path cuts the projection of a building, this is taken into account in the calculation of G_{path} (usually with $G = 0$) and in the calculation of the mean ground plane with the vertical height of the building.;

- (j) in the paragraph under the headings 'Reflections on vertical obstacles – Attenuation through absorption', the second and third sub-paragraphs are replaced by the following:

'Surfaces of objects are only considered as reflectors if their slopes are less than 15° with respect to the vertical. Reflections are considered only for paths in the vertical propagation plane, that is to say, not for laterally diffracted paths. For the incident and reflected paths, and assuming the reflecting surface is to be vertical, the point of reflection (which lays on the reflecting object) is constructed using straight lines under homogeneous and curved lines under favourable propagation conditions. The height of the reflector, when measured through the point of reflection and viewed from the direction of the incident ray, shall be at least 0,5 m. After projection onto a horizontal plane, the width of the reflector when measured through the point of reflection and viewed from the direction of the incident ray, shall be at least 0,5 m.;

- (k) in the paragraph under the headings 'Attenuation through retrodiffraction', the following is added to the end of the existing text:

'When there is a reflecting noise barrier or obstacle close to the railway track, the sound rays from the source are successively reflected off this obstacle and off the lateral face of the railway vehicle. In these conditions, the sound rays pass between the obstacle and railway vehicle body before diffraction from the top edge of the obstacle.

To take multiple reflections between railway vehicle and a nearby obstacle into account, the sound power of a single equivalent source is calculated. In this calculation, ground effects are ignored.

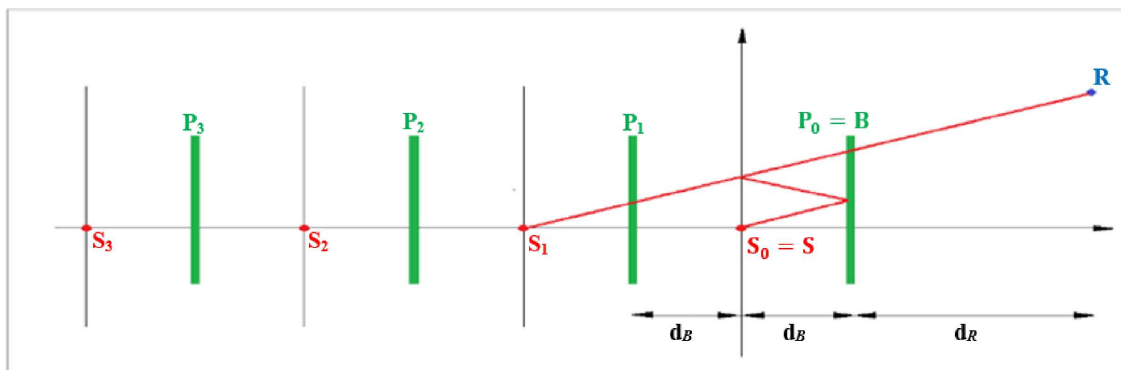
To derive the sound power of the equivalent source the following definitions apply:

- The origin of the coordinate system is the nearside railhead
- A real source, is located at S ($d_s=0$, h_s), where h_s is the height of the source relative to the railhead
- The plane $h = 0$ defines the cars' body
- A vertical obstacle with top at B (d_B , h_b)
- A receiver located at a distance $d_R > 0$ behind the obstacle where R has coordinates (d_B+d_R , h_R)

The inner side of the obstacle has absorption coefficients $a(f)$ per octave band. The railway vehicle body has an equivalent reflection coefficient C_{ref} . Normally C_{ref} is equal to 1. Only, in the case of open flat-bed freight wagons a value of 0 can be used. If $d_B > 5h_B$ or $a(f) > 0,8$ no train barrier interaction is taken into account.

In this configuration, multiple reflections between the railway vehicle body and the obstacle can be calculated using image sources positioned at S_n ($d_n = -2n \cdot d_B$, $h_n = h_s$), $n=0,1,2,...N$; as shown in the Figure 2.5.k.

Figure 2.5.k



The sound power of the equivalent source is expressed by:

$$L_{W,eq} = 10 \times \lg \left(\sum_{n=0}^N 10^{L_{W,n}/10} \right) \quad (2.5.39)$$

Where the sound power of the partial sources is given by:

$$L_{W,n} = L_W + \Delta L_n$$

$$\Delta L_n = \Delta L_{geo,n} + \Delta L_{dif,n} + \Delta L_{abs,n} + \Delta L_{ref,n} + \Delta L_{retrodiff,n}$$

With:

L_W	the sound power of the real source
$\Delta L_{geo,n}$	a correction term for spherical divergence
$\Delta L_{dif,n}$	a correction term for diffraction by the top of the obstacle
$\Delta L_{abs,n}$	a correction term for the absorption at the inner side of the obstacle
$\Delta L_{ref,n}$	a correction term for reflection from the railway vehicle body
$\Delta L_{retrodiff,n}$	a correction term for the finite height of the obstacle as a reflector

The correction for spherical divergence is given by

$$\Delta L_{geo,n} = 20 \times \lg \left(\frac{r_0}{r_n} \right) \quad (2.5.40)$$

$$r_n = |S_n R| = \sqrt{(d_n - (d_B + d_R))^2 + (h_n - h_R)^2} \quad (2.5.41)$$

The correction for diffraction by the top of the obstacle is given by:

(2.5.42)

$$\Delta L_{dif,n} = D_0 - D_n \quad (2.5.42)$$

Where D_n is the attenuation due to diffraction, calculated by means of formula 2.5.21 where $C'' = 1$, for the path linking source S_n to receiver R , taking into account diffraction at the top of the obstacle B :

$\delta_n = \pm (S_n B + BR - S_n R)$	(2.5.43)
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The correction for absorption on the inner side of the obstacle is given by:

$\Delta L_{abs,n} = 10 \cdot n \cdot \lg(1 - \alpha)$	(2.5.44)
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The correction for reflection from the railway vehicle body is given by:

$\Delta L_{ref,n} = 10 \cdot n \cdot \lg(C_{ref})$	(2.5.45)
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The correction for the finite height of the reflecting obstacle is taken into account by means of retro-diffraction. The ray path corresponding to an image of order $N > 0$ will be reflected n times by the obstacle. In the cross section, these reflections take place at distances

$d_i = - (2i - q)d_{b,i}$, $i = 1, 2, \dots, n$ Where $P_i(d = d_i, h = h_i)$, $i = 1, 2, \dots, n$ as the tops of these reflecting surfaces. At each of these points a correction term is calculated as:

$\Delta L_{retrodif,n} = \begin{cases} - \sum_{i=1}^n \Delta_{retrodif,n,i} & \text{if } n > 0 \\ 0 & \text{if } n = 0 \end{cases}$	(2.5.46)
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Where $\Delta_{retrodif,n,i}$ is calculated for a source at position S_n an obstacle top at P_i and a receiver at position R' . The position of the equivalent receiver R' is given by $R' = R$ if the receiver is above line of sight from S_n to B ; otherwise the equivalent receiver position is taken on the line of sight vertically above the real receiver; namely:

$d_{R'} = d_R$	(2.5.47)
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$h_{R'} = \max \left(h_R, h_B \frac{d_B + d_R - d_n}{d_B - d_n} \right)$	(2.5.48)'
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(10) Section 2.7.5 'Aircraft noise and performance', is replaced by the following:

2.7.5 Aircraft noise and performance

The ANP database provided in Appendix I contains aircraft and engine performance coefficients, departure and approach profiles as well as NPD relationships for a substantial proportion of civil aircraft operating from European Union airports. For aircraft types or variants for which data are not currently listed, they can best be represented by data for other, normally similar, aircrafts that are listed.

This data was derived to calculate noise contours for an average or representative fleet and traffic mix at an airport. It may not be appropriate to predict absolute noise levels of an individual aircraft model and is not suitable to compare the noise performance and characteristics of specific aircraft types, models or a specific fleet of aircraft. Instead, to determine which aircraft types, models or specific fleet of aircrafts are the noisiest contributors, the noise certificates shall be looked at.

The ANP database includes one or several default take-off and landing profiles for each aircraft type listed. The applicability of these profiles to the airport under consideration shall be examined, and either the fixed-point profiles or the procedural steps that best represent the flight operations at this airport shall be determined.'

- (11) In Section 2.7.11, the title of the second paragraph under the headings 'Track dispersion' is replaced by the following:

'Lateral track dispersion'.

- (12) In Section 2.7.12, after the sixth sub-paragraph and before the seventh and last sub-paragraph, the following sub-paragraph is inserted:

'An aircraft noise source should be entered at a minimum height of 1,0m (3,3ft) above the aerodrome level, or above the terrain elevation levels of the runway, as relevant.'

- (13) Section 2.7.13, '*Construction of flight path segments*', is replaced by the following:

2.7.13 Construction of flight path segments

Each flight path has to be defined by a set of segment coordinates (nodes) and flight parameters. The starting point is to determine the co-ordinates of the ground track segments. The flight profile is then calculated, remembering that for a given set of procedural steps, the profile depends on the ground track; e.g. at the same thrust and speed the aircraft climb rate is less in turns than in straight flight. Sub-segmentation is then undertaken for the aircraft on the runway (takeoff or landing ground roll), and for the aircraft near to the runway (initial climb or final approach). Airborne segments with significantly different speeds at their start and end points should then be sub-segmented. The two-dimensional co-ordinates of the ground track * segments are determined and merged with the two-dimensional flight profile to construct the three-dimensional flight path segments. Finally, any flight path points that are too close together are removed.

Flight profile

The parameters describing each flight profile segment at the start (suffix 1) and end (suffix 2) of the segment are:

s_1, s_2 distance along the ground track,
 z_1, z_2 aeroplane height,
 V_1, V_2 groundspeed,
 P_1, P_2 noise-related power parameter (matching that for which the NPD-curves are defined), and
 ϵ_1, ϵ_2 bank angle.

To build a flight profile from a set of procedural steps (*flight path synthesis*), segments are constructed in sequence to achieve required conditions at the end points. The end-point parameters for each segment become the start-point parameters for the next segment. In any segment calculation the parameters are known at the start; required conditions at the end are specified by the procedural step. The steps themselves are defined either by the ANP defaults or by the user (e.g. from aircraft flight manuals). The end conditions are usually height and speed; the profile building task is to determine the track distance covered in reaching those conditions. The undefined parameters are determined via flight performance calculations described in **Appendix B**.

If the ground track is straight, the profile points and associated flight parameters can be determined independently of the ground track (bank angle is always zero). However ground tracks are rarely straight; they usually incorporate turns and, to achieve best results, these have to be accounted for when determining the 2-dimensional flight profile, where necessary splitting profile segments at ground track nodes to inject changes of bank angle. As a rule the length of the next segment is unknown at the outset and it is calculated provisionally assuming no change of bank angle. If the provisional segment is then found to span one or more ground track nodes, the first being at s , namely $s_1 < s < s_2$, the segment is truncated at s , calculating the parameters there by interpolation (see below). These become the end-point parameters of the current segment and the start-point parameters of a new segment – which still has the same target end conditions. If there is no intervening ground track node the provisional segment is confirmed.

If the effects of turns on the flight profile are to be disregarded, the straight flight, single segment solution is adopted although the bank angle information is retained for subsequent use.

Whether or not turn effects are fully modelled, each 3-dimensional flight path is generated by merging its 2-dimensional flight profile with its 2-dimensional ground track. The result is a sequence of co-ordinate sets (x,y,z) , each being either a node of the segmented ground track, a node of the flight profile or both, the profile points being accompanied by the corresponding values of height z , ground speed V , bank angle ε and engine power P . For a track point (x,y) which lies between the end points of a flight profile segment, the flight parameters are interpolated as follows:

$z = z_1 + f \cdot (z_2 - z_1)$	(2.7.3)
$V = \sqrt{V_1^2 + f \cdot (V_2^2 - V_1^2)}$	(2.7.4)
$\varepsilon = \varepsilon_1 + f \cdot (\varepsilon_2 - \varepsilon_1)$	(2.7.5)
$P = \sqrt{P_1^2 + f \cdot (P_2^2 - P_1^2)}$	(2.7.6)

where

$f = (s - s_1) / (s_2 - s_1)$	(2.7.7)
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Note that whilst z and ε are assumed to vary linearly with distance, V and P are assumed to vary linearly with time (namely constant acceleration **).

When matching flight profile segments to radar data (*flight path analysis*) all end-point distances, heights, speeds and bank angles are determined directly from the data; only the power settings have to be calculated using the performance equations. As the ground track and flight profile coordinates can also be matched appropriately, this is usually quite straightforward.

Takeoff ground roll

When taking off, as an aircraft accelerates between the point of brake release (alternatively termed Start-of-Roll SOR) and the point of lift-off, speed changes dramatically over a distance of 1 500 to 2 500 m, from zero to between around 80 and 100 m/s.

The takeoff roll is thus divided into segments with variable lengths over each of which the aircraft speed changes by specific increment ΔV of no more than 10 m/s (about 20 kt). Although it actually varies during the takeoff roll, an assumption of constant acceleration is adequate for this purpose. In this case, for the takeoff phase, V_1 is initial speed, V_2 is the takeoff speed, n_{TO} is the number of takeoff segment and s_{TO} is the equivalent takeoff distance. For equivalent takeoff distance s_{TO} (see **Appendix B**) and takeoff speed V_1 and takeoff speed V_{TO} the number n_{TO} of segments for the ground roll is

$n_{TO} = \text{int} (1 + (V_{TO} - V_1) / 10)$	(2.7.8)
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and hence the change of velocity along a segment is

$\Delta V = V_{TO} / n_{TO}$	(2.7.9)
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and the time Δt on each segment is (constant acceleration assumed)

$\Delta t = \frac{2 \cdot s_{TO}}{V_{TO} \cdot n_{TO}}$	(2.7.10)
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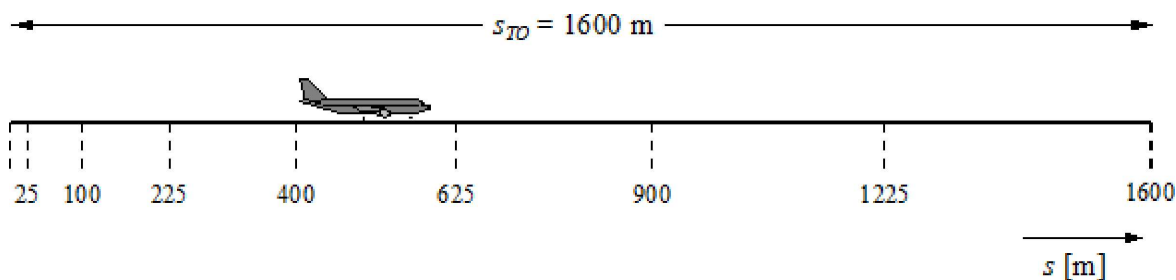
The length $s_{TO,k}$ of segment k ($1 \leq k \leq n_{TO}$) of the takeoff roll is then:

$$s_{TO,k} = (k - 0,5) \cdot \Delta V \cdot \Delta t = \frac{(2k - 1) \cdot s_{TO}}{n_{TO}^2} \quad (2.7.11)$$

Example: For a takeoff distance $s_{TO} = 1\,600$ m, $V_1 = 0$ m/s and $V_2 = 75$ m/s, this yields $n_{TO} = 8$ segments with lengths ranging from 25 to 375 metres (see **Figure 2.7.g**):

Figure 2.7.g

Segmentation of a takeoff roll (example for 8 segments)



Similarly to the speed changes, the aircraft thrust changes over each segment by a constant increment ΔP , calculated as

$$\Delta P = (P_{TO} - P_{init}) / n_{TO} \quad (2.7.12)$$

where P_{TO} and P_{init} respectively designate the aircraft thrust at the point of lift-off and the aircraft thrust at the start of takeoff roll.

The use of this constant thrust increment (instead of using the quadratic form equation 2.7.6) aims at being consistent with the linear relationship between thrust and speed in the case of jet-engine aircraft.

Important note: The above equations and example implicitly assume that the initial speed of the aircraft at the start of the takeoff phase is zero. This corresponds to the common situation where the aircraft starts to roll and accelerate from the brake release point. However, there are also situations where the aircraft may start to accelerate from its taxiing speed, without stopping at the runway threshold. In that case of non-zero initial speed V_{init} the following “generalised” equations should be used in replacement of equations 2.7.8, 2.7.9, 2.7.10 and 2.7.11.

$$\left\{ \begin{array}{l} n_{TO} = \text{int}(1 + |V_2 - V_1|/10) \\ \Delta V = (V_2 - V_1)/n \\ \Delta t = \frac{2 \cdot s}{(V_2 + V_1) \cdot n} \\ s_k = (V_1 + \Delta V \cdot (k - 0.5)) \cdot \frac{2 \cdot s}{(V_2 + V_1) \cdot n} \end{array} \right. \quad (2.7.13)$$

In this case, for the takeoff phase, V_1 is initial speed V_{init} , V_2 is the takeoff speed V_{TO} , n is the number of takeoff segment n_{TO} , s is the equivalent takeoff distance s_{TO} and s_k is the length $s_{TO,k}$ of segment k ($1 \leq k \leq n$).

The landing ground roll

Although the landing ground roll is essentially a reversal of the takeoff ground roll, special account has to be taken of

- reverse thrust which is sometimes applied to decelerate the aircraft, and
- aeroplanes leaving the runway after deceleration (aircraft that leave the runway no longer contribute to air noise as noise from taxiing is disregarded).

In contrast to the takeoff roll distance, which is derived from aircraft performance parameters, the stop distance s_{stop} (namely the distance from touchdown to the point where the aircraft leaves the runway) is not purely aircraft specific. Although a minimum stop distance can be estimated from aircraft mass and performance (and available reverse thrust), the actual stop distance depends also on the location of the taxiways, on the traffic situation, and on airport-specific regulations on the use of reverse thrust.

The use of reverse thrust is not a standard procedure – it is only applied if the needed deceleration cannot be achieved by the use of the wheel brakes. (Reverse thrust can be exceptionally disturbing as a rapid change of engine power from idle to reverse settings produces a sudden burst of noise.)

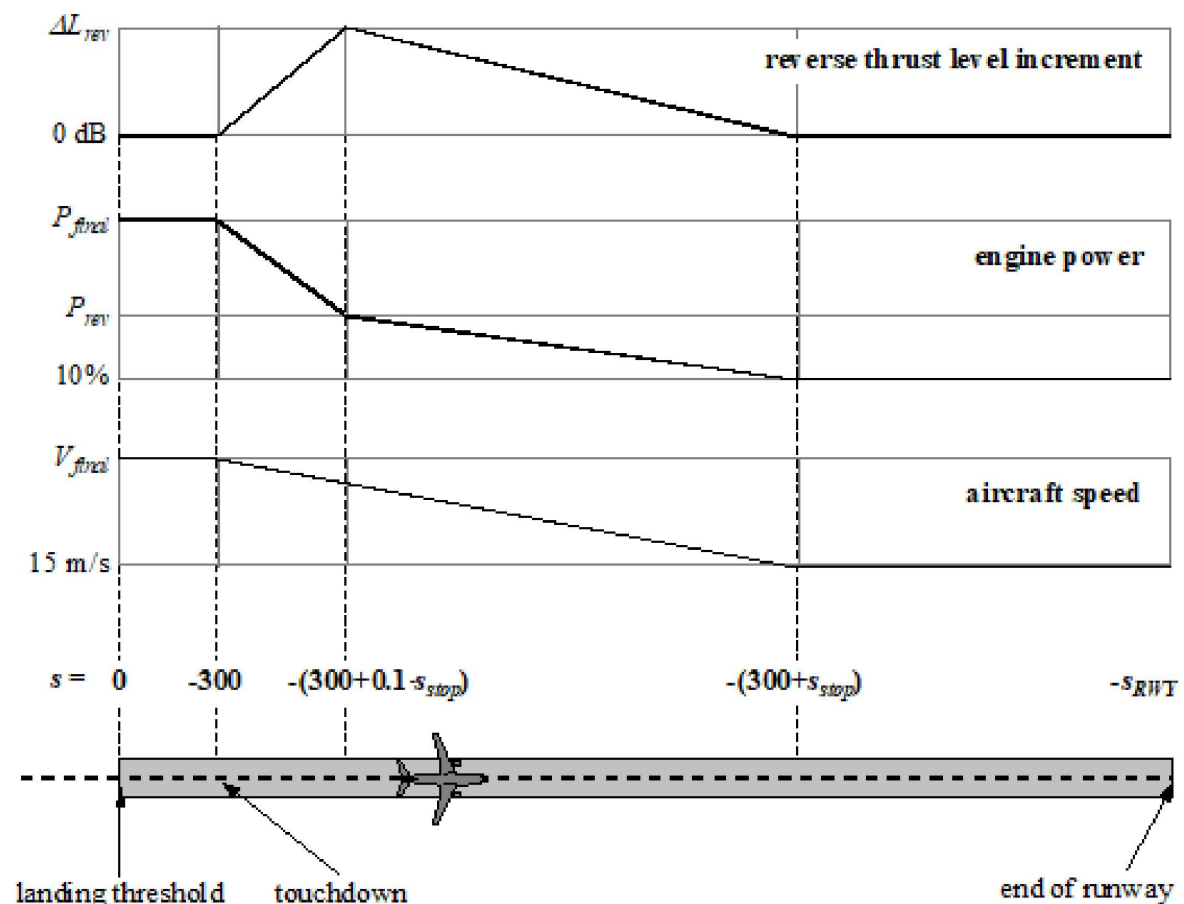
However, most runways are used for departures as well as for landings so that reverse thrust has a very small effect on the noise contours since the total sound energy in the vicinity of the runway is dominated by the noise produced from takeoff operations. Reverse thrust contributions to contours may only be significant when runway use is limited to landing operations.

Physically, reverse thrust noise is a very complex process but because of its relatively minor significance to air noise contours it can be modelled simplistically – the rapid change in engine power being taken into account by suitable segmentation.

It is clear that modelling the landing ground roll is less straightforward than for takeoff roll noise. The following simplified modelling assumptions are recommended for general use, when no detailed information is available (see **Figure 2.7.h.1**).

Figure 2.7.h.1

Modelling of landing ground roll



The aircraft crosses the landing threshold (which has the co-ordinate $s = 0$ along the approach ground track) at an altitude of 50 feet, and then continues to descend on its glideslope until it touches down on the runway. For a 3° glideslope, the touch-down point is 291 m beyond the landing threshold (as illustrated in Figure 2.7.h.1). The aircraft is then decelerated over a stop-distance s_{stop} – aircraft specific values of which are given in the ANP database – from final approach speed V_{final} to 15 m/s. Because of the rapid changes in speed during this segment it should be sub-segmented in the same manner as for the takeoff ground roll (or airborne segments with rapid speed changes), using the generalised equations 2.7.13 (as taxi-in speed is not equal to zero). The engine power changes from final approach power at touchdown to a reverse thrust power setting P_{rev} over a distance $0,1 \cdot s_{stop}$, then decreases to 10 % of the maximum available power over the remaining 90 percent of the stop distance. Up to the end of the runway (at $s = -s_{RWY}$) aircraft speed remains constant.

NPD curves for reverse thrust are not at present included in the ANP database, and it is therefore necessary to rely on the conventional curves for modelling this effect. Typically the reverse thrust power P_{rev} is around 20 % of the full power setting and this is recommended when no operational information is available. However, at a given power setting, reverse thrust tends to generate significantly more noise than forward thrust and an increment ΔL shall be applied to the NPD-derived event level, increasing from zero to a value ΔL_{rev} (5 dB is recommended provisionally ***) along $0,1 \cdot s_{stop}$ and then falling linearly to zero along the remainder of the stop distance.

Segmentation of the initial climb and final approach segments

The segment-to-receiver geometry changes rapidly along the initial climb and final approach airborne segments, particularly with respect to observer locations to the side of the flight track, where the elevation angle (*beta angle*) also changes rapidly as the aircraft climbs or descends through these initial/final segments. Comparisons with very small segment calculations show that using a single (or a limited number of) climb or approach airborne segment(s) below a certain height (relative to the runway) results in a poor approximation of noise to the side of the flight track for integrated metrics. This is due to the application of a single lateral attenuation adjustment on each segment, corresponding to a single segment-specific value of the elevation angle, whereas the rapid change of this parameter results in significant variations of the lateral attenuation effect along each segment. Calculation accuracy is improved by sub-segmenting the initial climb and last approach airborne segments. The number of sub-segments and the length of each determine the lateral attenuation change “granularity” which will be accounted for. Noting the expression of total lateral attenuation for aircraft with fuselage-mounted engines, it can be shown that for a limiting change in lateral attenuation of 1,5 dB per sub-segment, the climb and approach airborne segments located below a height of 1 289,6 m (4 231 ft) above the runway should be sub-segmented based on the following set of height values:

$z = \{18,9, 41,5, 68,3, 102,1, 147,5, 214,9, 334,9, 609,6, 1\,289,6\}$ metres, or

$z = \{62, 136, 224, 335, 484, 705, 1\,099, 2\,000, 4\,231\}$ feet

For each original segment below 1 289,6 m (4 231 ft), the above heights are implemented by identifying which height in the set above is closest to the original endpoint height (for a climb segment) or start-point height (for an approach segment). The actual sub-segment heights, z_i , would then be calculated using:

$$z_i = z_e [z'_i / z'_N] \quad (i = k..N)$$

where:

z_e is the original segment endpoint height (climb) or start-point height (approach)

z'_i is the i^{th} member of the set of height values listed above

z'_N is the closest height from the set of height values listed above to height z_e

k denotes the index of the first member of the set of height values for which the calculated z_k is strictly greater than the endpoint height of the previous original climb segment or the start-point height of the next original approach segment to be sub-segmented.

In the specific case of an initial climb segment or last approach segment, $k = 1$, but in the more general case of airborne segments not connected to the runway, k will be greater than 1.

Example for an initial climb segment:

If the original segment endpoint height is $z_e = 304,8$ m, then from the set of height values, $214,9 \text{ m} < z_e < 334,9 \text{ m}$ and the closest height from the set to z_e is $z'_7 = 334,9$ m. The sub-segment endpoint heights are then computed by:

$$z_i = 304,8 [z'_i / 334,9] \text{ for } i = 1 \text{ to } 7$$

(noting that $k=1$ in that case, as this is an initial climb segment)

Thus z_1 would be 17,2 m and z_2 would be 37,8 m, etc.

Segmentation of airborne segments

For airborne segments where there is a significant speed change along a segment, this shall be subdivided as for the ground roll, namely

$n_{\text{seg}} = \text{int} (1 + V_2 - V_1 /10)$	(2.7.14)
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where V_1 and V_2 are the segment start and end speeds respectively. The corresponding sub-segment parameters are calculated in a similar manner as for the takeoff ground roll, using equations 2.7.9 to 2.7.11.

Ground track

A ground track, whether a backbone track or a dispersed sub-track, is defined by a series of (x,y) co-ordinates in the ground plane (e.g. from radar information) or by a sequence of vectoring commands describing straight segments and circular arcs (turns of defined radius r and change of heading $\Delta\xi$).

For segmentation modelling, an arc is represented by a sequence of straight segments fitted to sub-arcs. Although they do not appear explicitly in the ground-track segments, the banking of aircraft during turns influences their definition. **Appendix B4** explains how to calculate bank angles during a steady turn but of course these are not actually applied or removed instantaneously. How to handle the transitions between straight and turning flight, or between one turn and an immediately sequential one, is not prescribed. As a rule, the details, which are left to the user (see **Section 2.7.11**), are likely to have a negligible effect on the final contours; the requirement is mainly to avoid sharp discontinuities at the ends of the turn and this can be achieved simply, for example, by inserting short transition segments over which the bank angle changes linearly with distance. Only in the special case that a particular turn is likely to have a dominating effect on the final contours would it be necessary to model the dynamics of the transition more realistically, to relate bank angle to particular aircraft types and to adopt appropriate roll rates. Here it is sufficient to state that the end sub-arcs $\Delta\xi_{\text{trans}}$ in any turn are dictated by bank angle change requirements. The remainder of the arc with change of heading $\Delta\xi - 2 \cdot \Delta\xi_{\text{trans}}$ degrees is divided into n_{sub} sub-arcs according to the equation:

$n_{\text{sub}} = \text{int} (1 + (\Delta\xi - 2 \cdot \Delta\xi_{\text{trans}}) / 10)$	(2.7.15)
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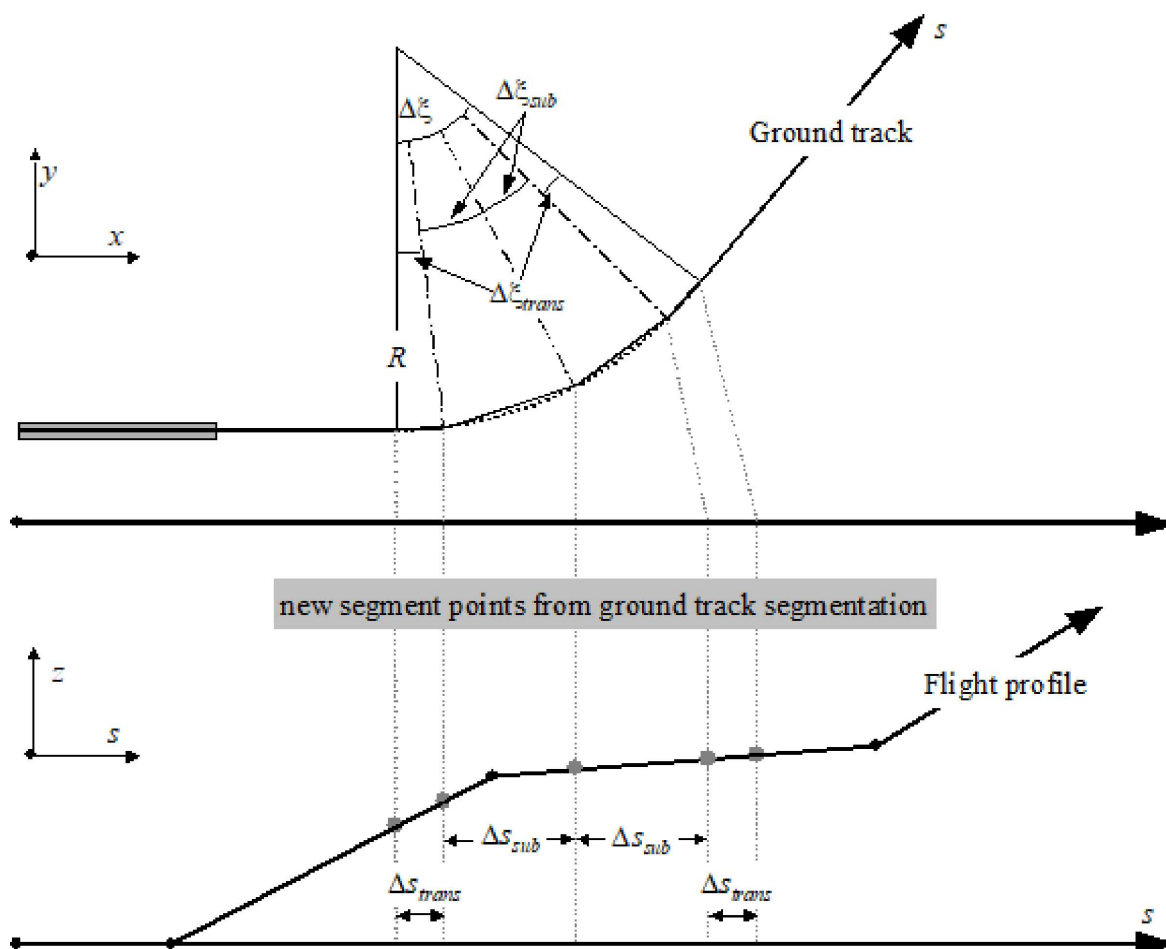
where $\text{int}(x)$ is a function that returns the integer part of x . Then the change of heading $\Delta\xi_{\text{sub}}$ of each sub-arc is computed as

$\Delta\xi_{\text{sub}} = (\xi - 2 \cdot \Delta\xi_{\text{trans}}) / n_{\text{sub}}$	(2.7.16)
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where n_{sub} needs to be large enough to ensure that $\Delta\xi_{\text{sub}} \leq 10$ degrees. The segmentation of an arc (excluding the terminating transition sub-segments) is illustrated in **Figure 2.7.h.2 ******.

Figure 2.7.h.2

Construction of flight path segments dividing turn into segments of length Δs (upper view in horizontal plane, lower view in vertical plane)



Once the ground track segments have been established in the x-y plane, the flight profile segments (in the s-z plane) are overlaid to produce the three-dimensional (x, y, z) track segments.

The ground track should always extend from the runway to beyond the extent of the calculation grid. This can be achieved, if necessary, by adding a straight segment of suitable length to the last segment of the ground track.

The total length of the flight profile, once merged with the ground track, must also extend from the runway to beyond the extent of the calculation grid. This can be achieved, if necessary, by adding an extra profile point:

- to the end of a departure profile with speed and thrust values equal to those of the last departure profile point, and height extrapolated linearly from the last and penultimate profile points, or
- to the beginning of an arrival profile with speed and thrust value equal to those of the first arrival profile point, and height extrapolated linearly back from the first and second profile points.

Segmentation adjustments of airborne segments

After the 3-D flight path segments have been derived according to the procedure described in **Section 2.7.13**, further segmentation adjustments may be necessary to remove flight path points which are too close together.

When adjacent points are within 10 metres of each other, and when the associated speeds and thrusts are the same, one of the points should be eliminated.

- * For this purpose the total length of the ground track should always exceed that of the flight profile. This can be achieved, if necessary, by adding straight segments of suitable length to the last segment of the ground track.
- ** Even if engine power settings remain constant along a segment, propulsive force and acceleration can change due to variation of air density with height. However, for the purposes of noise modelling these changes are normally negligible.
- *** This was recommended in the previous edition of ECAC Doc 29 but is still considered provisional pending the acquisition of further corroborative experimental data.
- **** Defined in this simple way, the total length of the segmented path is slightly less than that of the circular path. However the consequent contour error is negligible if the angular increments are below 30°.

(14) Section 2.7.1.6. 'Determination of event levels from NPD-data', is replaced by the following:

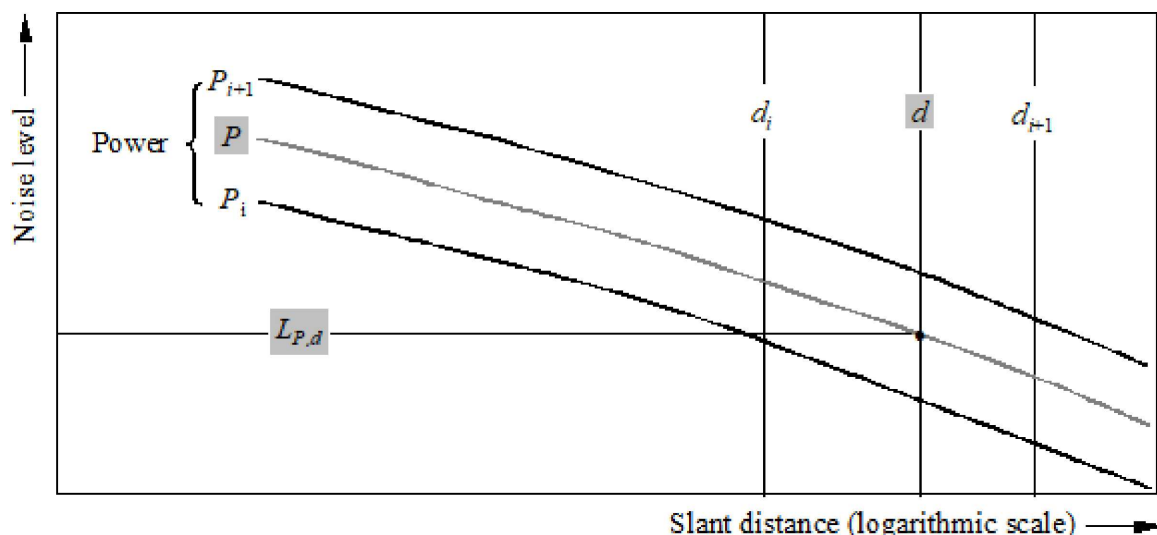
2.7.16 Determination of event levels from NPD-data

The principal source of aircraft noise data is the international Aircraft Noise and Performance (ANP) database. This tabulates L_{max} and L_E as functions of propagation distance d – for specific aircraft types, variants, flight configurations (approach, departure, flap settings), and power settings P . They relate to steady flight at specific reference speeds V_{ref} along a notionally infinite, straight flight path *.

How values of the independent variables P and d are specified is described later. In a single look-up, with input values P and d , the output values required are the *baseline levels* $L_{max}(P,d)$ and/or $L_E(P,d)$ (applicable to an infinite flight path). Unless values happen to be tabulated for P and/or d exactly, it will generally be necessary to estimate the required event noise level(s) by interpolation. A linear interpolation is used between tabulated power-settings, whereas a logarithmic interpolation is used between tabulated distances (see **Figure 2.7.i**).

Figure 2.7.i

Interpolation in noise-power-distance curves



If P_i and P_{i+1} are engine power values for which noise level versus distance data are tabulated, the noise level $L(P)$ at a given distance for intermediate power P , between P_i and P_{i+1} , is given by:

$$L(P) = L(P_i) + \frac{L(P_{i+1}) - L(P_i)}{P_{i+1} - P_i} \cdot (P - P_i) \quad (2.7.19)$$

If, at any power setting, d_i and d_{i+1} are distances for which noise data are tabulated, the noise level $L(d)$ for an intermediate distance d , between d_i and d_{i+1} is given by

$L(d) = L(d_i) + \frac{L(d_{i+1}) - L(d_i)}{\log d_{i+1} - \log d_i} \cdot (\log d - \log d_i)$	(2.7.20)
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By using equations (2.7.19) and (2.7.20), a noise level $L(P,d)$ can be obtained for any power setting P and any distance d that is within the envelope of the NPD data base.

For distances d that lie outside the NPD envelope, equation 2.7.20 is used to extrapolate from the last two values, namely inwards from $L(d_1)$ and $L(d_2)$ or outwards from $L(d_{I-1})$ and $L(d_I)$ where I is the total number of NPD points on the curve. Thus

Inwards:

$L(d) = L(d_2) + \frac{L(d_1) - L(d_2)}{\log d_2 - \log d_1} \cdot (\log d_2 - \log d)$	(2.7.21)
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Outwards:

$L(d) = L(d_{I-1}) + \frac{L(d_I) - L(d_{I-1})}{\log d_I - \log d_{I-1}} \cdot (\log d - \log d_{I-1})$	(2.7.22)
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As, at short distances d , noise levels increase very rapidly with decreasing propagation distance, it is recommended that a lower limit of 30 m be imposed on d , namely $d = \max(d, 30 \text{ m})$.

Impedance adjustment of standard NPD data

The NPD data provided in the ANP database are normalized to reference atmospheric conditions (temperature of 25 °C and pressure of 101,325 kPa). Before applying the interpolation/extrapolation method previously described, an acoustic impedance adjustment shall be applied to these standard NPD data.

Acoustic impedance is related to the propagation of sound waves in an acoustic medium, and is defined as the product of the density of air and the speed of sound. For a given sound intensity (power per unit area) perceived at a specific distance from the source, the associated sound pressure (used to define SEL and L_{Amax} metrics) depends on the acoustic impedance of the air at the measurement location. It is a function of temperature, atmospheric pressure (and indirectly altitude). There is therefore a need to adjust the standard NPD data of the ANP database to account for the actual temperature and pressure conditions at the receiver point, which are generally different from the normalized conditions of the ANP data.

The impedance adjustment to be applied to the standard NPD levels is expressed as follows:

$\Delta_{Impedance} = 10 \cdot \lg \left(\frac{\rho \cdot c}{409,81} \right)$	(2.7.23)
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where:

$\Delta_{Impedance}$	Impedance adjustment for the actual atmospheric conditions at the receiver point (dB)
$\rho \cdot c$	Acoustic impedance (newton seconds/m ³) of the air at the aerodrome elevation (409,81 being the air impedance associated to the reference atmospheric conditions of the NPD data in the ANP database).

Impedance $\rho \cdot c$ is calculated as follows:

$\rho \cdot c = 416,86 \cdot \left[\frac{\delta}{\vartheta^{1/2}} \right]$	(2.7.24)
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δ p/p_0 , the ratio of the ambient air pressure at the observer altitude to the standard air pressure at mean sea level: $p_0 = 101,325$ kPa (or 1 013,25 mb)

ϑ $(T + 273,15)/(T_0 + 273,15)$ the ratio of the air temperature at the observer altitude to the standard air temperature at mean sea level: $T_0 = 15,0$ °C

The acoustic impedance adjustment is usually less than a few tenths of one dB. In particular, it should be noted that under the standard atmospheric conditions ($p_0 = 101,325$ kPa and $T_0 = 15,0$ °C), the impedance adjustment is less than 0,1 dB (0,074 dB). However, when there is a significant variation in temperature and atmospheric pressure relative to the reference atmospheric conditions of the NPD data, the adjustment can be more substantial.

* Although the notion of an infinitely long flight path is important to the definition of event sound exposure level L_E , it has less relevance in the case of event maximum level L_{max} which is governed by the noise emitted by the aircraft when at a particular position at or near its closest point of approach to the observer. For modelling purposes the NPD distance parameter is taken to be the minimum distance between the observer and segment.’

- (15) In Section 2.7.18. ‘*Flight path segment parameters*’, the paragraph under the headings ‘Segment power P’ is replaced by the following:

‘*Segment power P*

The tabulated NPD data describe the noise of an aircraft in steady straight flight on an infinite flight path, that is to say, at constant engine power P . The recommended methodology breaks actual flight paths, along which speed and direction vary, into a number of finite segments, each of which is then taken to be part of a uniform, infinite flight path for which the NPD data are valid. But the methodology provides for changes of power along the length of a segment; it is taken to change quadratically with distance from P_1 at its start to P_2 at its end. It is therefore necessary to define an equivalent steady segment value P . This is taken to be the value at the point on the segment that is closest to the observer. If the observer is alongside the segment (Figure 2.7.k) it is obtained by interpolation as given by equation 2.7.8 between the end values, namely

$P = \sqrt{P_1^2 + \frac{q}{\lambda} \cdot (P_2^2 - P_1^2)}$	(2.7.31)
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If the observer is behind or ahead of the segment, it is that at the nearest end point, P_1 or P_2 .’

- (16) Section 2.7.19 is amended as follows

- (a) in the paragraph under the headings ‘*The duration correction DV (Exposure levels L_E only)*’ until and including the formula 2.7.34 is replaced by the following:

‘*The duration correction Δ_V (Exposure levels L_E only)*

This correction * accounts for a change in exposure levels if the actual segment groundspeed is different to the aircraft reference speed V_{ref} to which the basic NPD-data relate.

Like engine power, speed varies along the flight path segment (from V_{T1} to V_{T2} , which are the speeds output from Appendix B or from a previously pre-calculated flight profile).

For airborne segments, V_{seg} is the segment speed at the closest point of approach, S , interpolated between the segment end-point values assuming it varies quadratically with time; namely if the observer is alongside the segment:

$V_{seg} = \sqrt{V_1^2 + \frac{q}{\lambda} \cdot (V_2^2 - V_1^2)}$	(2.7.32)
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* This is known as the *duration correction* because it makes allowance for the effects of aircraft *speed* on the duration of the sound event – implementing the simple assumption that, other things being equal, duration, and thus received event sound energy, is inversely proportional to source velocity.;

- (b) the formula numbers '(2.7.35)', '(2.7.36)' and '(2.7.37)', are respectively replaced by the following other numbers:

'(2.7.33)', '(2.7.34)' and '(2.7.35)';

- (c) the following first two words of the paragraph under the headings 'Sound propagation geometry' are replaced by the following:

'Figure 2.7.m':

- (d) the table in the second subparagraph is replaced by the following:

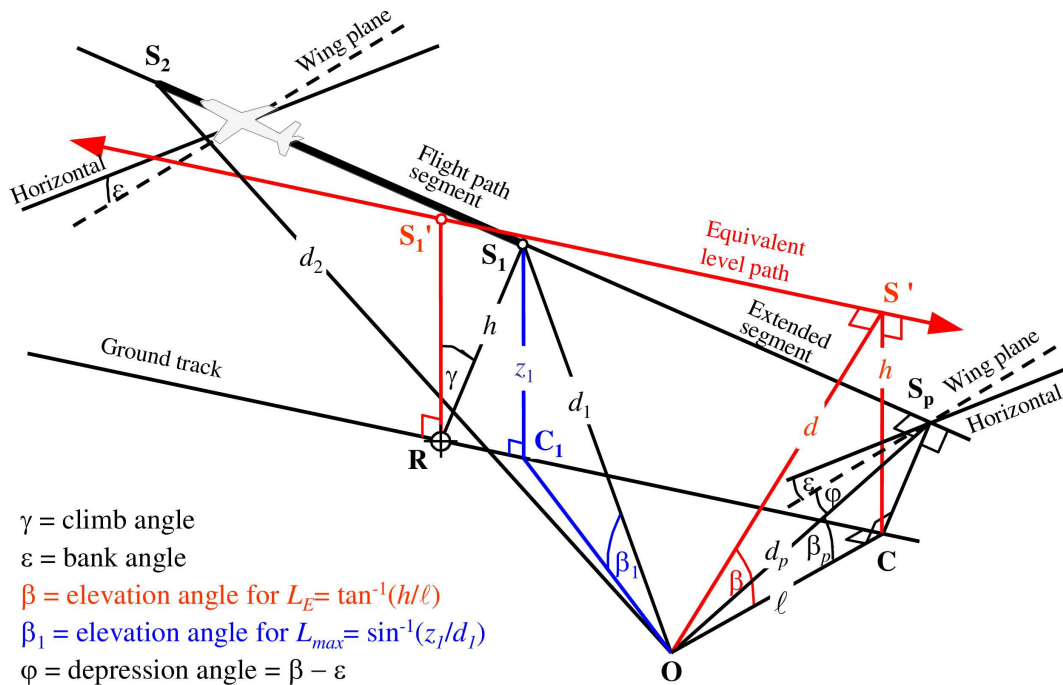
'a = 0,00384,	b = 0,0621,	c = 0,8786	for wing-mounted engines and	(2.7.36)
a = 0,1225,	b = 0,3290,	c = 1	for fuselage-mounted engines.	(2.7.37)'

- (e) the text under the Figure 2.7.p is replaced by the following:

'To calculate the lateral attenuation using equation (2.7.40) (where β is measured in a vertical plane), an extended level flight path is recommended. An extended level flight path is defined in the vertical plane through S_1S_2 and with the same perpendicular slant distance d_p from the observer. This is visualised by rotating the triangle **ORS**, and its attached flight path about **OR** (see **Figure 2.7p**) through angle γ thus forming the triangle **ORS'**. The elevation angle of this equivalent level path (now in a vertical plane) is $\beta = \tan^{-1}(h/\ell)$ (ℓ remains unchanged). In this case, for an observer alongside, angle β and the resulting lateral attenuation $\Lambda(\beta, \ell)$ are the same for L_E and L_{max} metrics.

Figure 2.7.r illustrates the situation when the observer point **O** lies *behind the finite segment*, not alongside. Here the segment is observed as a more distant part of an infinite path; a perpendicular can only be drawn to point S_p on its extension. The triangle **OS₁S₂** accords with **Figure 2.7.j** which defines the segment correction Δ_F . But in this case the parameters for lateral directivity and attenuation are less obvious.

Figure 2.7.r

Observer behind segment

For maximum level metrics, the NPD distance parameter is taken as the shortest distance to the segment, namely $d = d_1$. For exposure level metrics, it is the shortest distance d_p from O to S_p on the extended flight path; namely the level interpolated from the NPD table is $L_{E\infty}(P_1, d_p)$.

The geometrical parameters for lateral attenuation also differ for maximum and exposure level calculations. For *maximum level* metrics the adjustment $\Lambda(\beta, \ell)$ is given by equation 2.7.40 with $\beta = \beta_1 = \sin^{-1}(z_1/d_1)$ and $\ell = OC_1 = \sqrt{d_1^2 - z_1^2}$ where β_1 and d_1 are defined by the triangle OC_1S_1 in the vertical plane through O and S_1 .

When calculating the lateral attenuation for airborne segments only and *exposure level* metrics, ℓ remains the shortest lateral displacement from the segment extension (OC). But to define an appropriate value of β it is again necessary to visualise an (infinite) *equivalent level flight path* of which the segment can be considered part. This is drawn through S_1' , height h above the surface, where h is equal to the length of RS_1 the perpendicular from the ground track to the segment. This is equivalent to rotating the actual extended flight path through angle γ about point R (see Figure 2.7.q). Insofar as R is on the perpendicular to S_1 , the point on the segment that is closest to O , the construction of the equivalent level path is the same as when O is alongside the segment.

The closest point of approach of the equivalent level path to the observer O is at S' , slant distance d , so that the triangle OCS' so formed in the vertical plane then defines the elevation angle $\beta = \cos^{-1}(\ell/d)$. Although this transformation might seem rather convoluted, it should be noted that the basic source geometry (defined by d_1 , d_2 and φ) remains untouched, the sound travelling from the segment *towards* the observer is simply what it would be if the entire flight along the infinitely extended inclined segment (of which for modelling purposes the segment forms part) were at constant speed V and power P_1 . The lateral attenuation of sound from the segment *received* by the observer, on the other hand, is related not to β_p , the elevation angle of the extended path, but to β , that of the equivalent level path.

Remembering that, as conceived for modelling purposes, the engine installation effect Δ_i is two-dimensional, the defining depression angle φ is still measured laterally from the aircraft wing plane (the baseline event level is still that generated by the aircraft traversing the infinite flight path represented by the extended segment). Thus the depression angle is determined at the closest point of approach, namely $\varphi = \beta_p - \epsilon$ where β_p is angle S_pOC .

The case of an observer ahead of the segment is not described separately; it is evident that this is essentially the same as the case of the observer behind.

However, for exposure level metrics where observer locations are behind ground segments during the takeoff roll and ahead of ground segments during the landing roll, the value of β becomes the same as that for maximum level metrics.

For locations behind takeoff roll segments:

$$\beta = \beta_1 = \sin^{-1}(z_1/d_1) \text{ and } \ell = OC_1 = \sqrt{d_1^2 - z_1^2}$$

For locations ahead of landing roll segments:

$$\beta = \beta_2 = \sin^{-1}(z_2/d_2) \text{ and } \ell = OC_2 = \sqrt{d_2^2 - z_2^2}$$

The rationale for using these particular expressions is related to the application of the start-of-roll directivity function behind takeoff roll segments and a semi-circular directivity assumption ahead of landing roll segments.

The finite segment correction Δ_F (Exposure levels L_E only)

The adjusted baseline noise exposure level relates to an aircraft in continuous, straight, steady level flight (albeit with a bank angle ε that is inconsistent with straight flight). Applying the (negative) *finite segment correction* $\Delta_F = 10 \cdot \lg(F)$, where F is the *energy fraction*, further adjusts the level to what it would be if the aircraft traversed the finite segment only (or were completely silent for the remainder of the infinite flight path).

The energy fraction term accounts for the pronounced longitudinal directivity of aircraft noise and the angle subtended by the segment at the observer position. Although the processes that cause the directionality are very complex, studies have shown that the resulting contours are quite insensitive to the precise directional characteristics assumed. The expression for Δ_F below is based on a fourth-power 90-degree dipole model of sound radiation. It is assumed to be unaffected by lateral directivity and attenuation. How this correction is derived is described in detail in **Appendix E**.

The energy fraction F is a function of the “view” triangle OS_1S_2 defined in **Figures 2.7.j to 2.7.l** such that:

$\Delta_F = 10 \cdot \log \left[\frac{1}{\pi} \left(\frac{\alpha_2}{1 + \alpha_2^2} + \arctan \alpha_2 - \frac{\alpha_1}{1 + \alpha_1^2} - \arctan \alpha_1 \right) \right]$	(2.7.45)
--	----------

With

$$\alpha_1 = -\frac{q}{d_\lambda}; \alpha_2 = -\frac{q - \lambda}{d_\lambda}; d_\lambda = d_0 \cdot 10^{[L_{E\infty}(P, d_p) - L_{max}(P, d_p)]/10}; d_0 = \frac{2}{\pi} \cdot V_{ref} \cdot t_0.$$

where $d\lambda$ is known as the “scaled distance” (see **Appendix E**) and $V_{ref} = 270,05$ ft/s (for the 160 knots reference speed). Note that $L_{max}(P, d_p)$ is the maximum level, from NPD data, for perpendicular distance d_p , NOT the segment L_{max} . It is advised to apply a lower limit of -150 dB to Δ_F .

In the particular case of observer locations behind every takeoff ground-roll segment, a reduced form of the noise fraction expressed in Equation 2.7.45 is used, which corresponds to the specific case of $q = 0$.

This is denoted $\Delta'_{F,d}$ where “d” clarifies its use for departure operations, and is computed as:

$\Delta'_{F,d} = 10 \cdot \log_{10} \left[\frac{1}{\pi} \left(\frac{\alpha_2}{1 + \alpha_2^2} + \arctan \alpha_2 \right) \right]$	(2.7.46.a)
---	------------

where $\alpha_2 = \lambda / d\lambda$.

This particular form of the noise fraction is used in conjunction with the start-of-roll directivity function, whose application method is further explained in the section below.

In the particular case of observer locations ahead of every landing ground-roll segment, a reduced form of the noise fraction expressed in equation 2.7.45 is used, which corresponds to the specific case of $q = \lambda$. This is denoted $\Delta'_{F,a}$ where “a” clarifies its use for arrival operations, and is computed as:

$\Delta'_{F,a} = 10 \cdot \log_{10} \left[\frac{1}{\pi} \left(-\frac{\alpha_1}{1 + \alpha_1^2} - \arctan \alpha_1 \right) \right]$	(2.7.46.b)
--	------------

where $\alpha_1 = -\lambda / d\lambda$.

The use of this form, without the application of any further horizontal directivity adjustment (unlike the case of locations behind takeoff ground-roll segments – see section on start-of-roll directivity), implicitly assumes a semi-circular horizontal directivity ahead of landing ground roll segments.

The start-of-roll directivity function Δ_{SOR}

The noise of aircraft – especially jet aircraft equipped with lower by-pass ratio engines – exhibits a lobed radiation pattern in the rearward arc, which is characteristic of jet exhaust noise. This pattern is the more pronounced the higher the jet velocity and the lower the aircraft speed. This is of special significance for observer locations behind the start of roll, where both conditions are fulfilled. This effect is taken into account by a directivity function Δ_{SOR} .

The function Δ_{SOR} has been derived from several noise measurement campaigns using microphones adequately positioned behind and on the side of the SOR of departing jet aircraft.

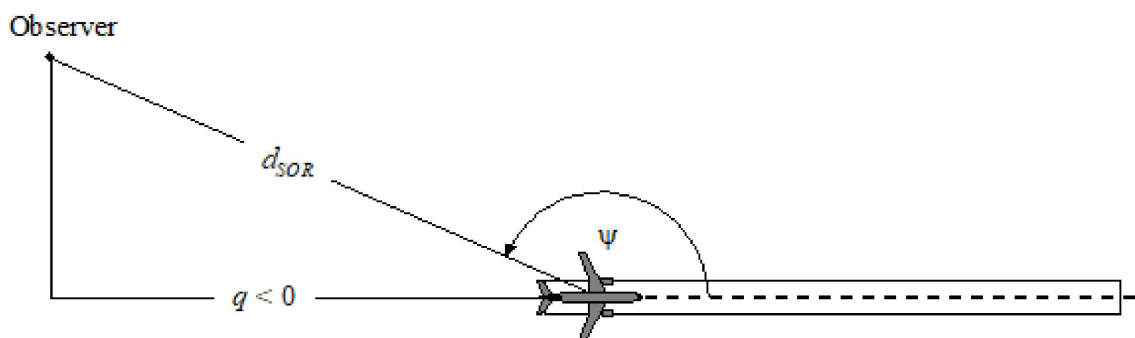
Figure 2.7.r shows the relevant geometry. The azimuth angle Ψ between the aircraft longitudinal axis and the vector to the observer is defined by

$\psi = \arccos \left(\frac{q}{d_{SOR}} \right).$	(2.7.47)
--	----------

The relative distance q is negative (see **Figure 2.7.j**) so that Ψ ranges from 90° relative to the aircraft forward heading, to 180° in the reverse direction.

Figure 2.7.r

Aircraft-observer geometry for estimation of directivity correction



The function Δ_{SOR} represents the variation of the overall noise emanating from the takeoff ground roll measured behind the start of roll, relatively to the overall noise from takeoff ground roll measured on the side of the SOR, at the same distance:

$$L_{TGR}(d_{SOR}, \psi) = L_{TGR}(d_{SOR}, 90^\circ) + \Delta_{SOR}(d_{SOR}, \psi) \quad (2.7.48)$$

where $L_{TGR}(d_{SOR}, 90^\circ)$ is the overall takeoff ground roll noise level at the point distance d_{SOR} to the side of the SOR. Δ_{SOR} is implemented as an adjustment to the noise level from one flight path segment (e.g. $L_{max,seg}$ or $L_{E,seg}$), as described in equation 2.7.28.

The SOR directivity function, in decibels, for *turbofan-powered jet aircraft* is given by the following equation:

For $90^\circ \leq \Psi < 180^\circ$ then:

$\Delta_{SOR}^0 = 2\,329,44 - (8,0573 \cdot \psi) + \left(11,51 \cdot \exp\left(\frac{\pi \cdot \psi}{180}\right)\right) - \left(\frac{3,4601 \cdot \psi}{\ln\left(\frac{\pi \cdot \psi}{180}\right)}\right) - \left(\frac{17403338,3 \cdot \ln\left(\frac{\pi \cdot \psi}{180}\right)}{\psi^2}\right)$	(2.7.49)
---	----------

The SOR directivity function, in decibels, for *turboprop-powered aircraft* is given by the following equation:

For $90^\circ \leq \Psi < 180^\circ$ then:

$\Delta_{SOR}^0 = -34643,898 + \left(\frac{30722161,987}{\psi}\right) - \left(\frac{11491573930,510}{\psi^2}\right) + \left(\frac{2349285669062}{\psi^3}\right) - \left(\frac{283584441904272}{\psi^4}\right) + \left(\frac{20227150391251300}{\psi^5}\right) - \left(\frac{790084471305203000}{\psi^6}\right) + \left(\frac{13050687178273800000}{\psi^7}\right)$	(2.7.50)
--	----------

If the distance d_{SOR} exceeds the normalising distance $d_{SOR,0}$, the directivity correction is multiplied by a correction factor to account for the fact that the directivity becomes less pronounced for greater distances from the aircraft; namely

$\Delta_{SOR} = \Delta_{SOR}^0 \text{ if } d_{SOR} \leq d_{SOR,0}$	(2.7.51)
$\Delta_{SOR} = \Delta_{SOR}^0 \cdot \frac{d_{SOR,0}}{d_{SOR}} \text{ if } d_{SOR} > d_{SOR,0}$	(2.7.52)

The normalising distance $d_{SOR,0}$ equals 762 m (2 500 ft).

The Δ_{SOR} function described above mostly captures the pronounced directivity effect of the initial portion of the takeoff roll at locations behind the SOR (because it is the closest to the receivers, with the highest jet velocity to aircraft speed ratio). However, the use of the hence established Δ_{SOR} is “generalised” to positions behind *each* individual takeoff ground roll segment, so not only behind the start-of-roll point (in the case of takeoff). *The established Δ_{SOR} is not applied to positions ahead of individual takeoff ground roll segments, nor is it applied to positions behind or ahead of individual landing ground roll segments.*

The parameters d_{SOR} and Ψ are calculated relative to the start of each individual ground roll segment. The event level L_{SEG} for a location behind a given takeoff ground-roll segment is calculated to comply with the formalism of the Δ_{SOR} function: it is essentially calculated for the reference point located on the side of the start point of the segment, at the same distance d_{SOR} as the actual point, and is further adjusted with Δ_{SOR} to obtain the event level at the actual point.

Note: Formulas (2.7.53), (2.7.54) and (2.7.55) were removed in the latest amendment of this Annex.’

(17) Section 2.8 is replaced by the following:

‘2.8 Exposure to noise

Determination of the area exposed to noise

The assessment of the area exposed to noise is based on noise assessment points at $4 \text{ m} \pm 0,2$ above the ground, corresponding to the receiver points as defined in 2.5, 2.6 and 2.7, calculated on a grid for individual sources.

Grid points that are located inside buildings shall be assigned a noise level result by assigning the quietest nearby noise receiver points outside buildings, except for aircraft noise where the calculation is performed without considering the presence of buildings and in which case the noise receiver point falling within a building is directly used.

Depending on the grid resolution, the corresponding area is assigned to each calculation point in the grid. For example, with a 10 m × 10 m grid, each assessment point represents an area of 100 square metres that is exposed to the calculated noise level.

Assigning noise assessment points to buildings not containing dwellings

The assessment of the exposure of buildings not containing dwellings such as schools and hospitals to noise is based on noise assessment points at $4 \pm 0,2$ m above the ground, corresponding to the receiver points as defined in 2.5, 2.6 and 2.7

For the assessment of buildings not containing dwellings and exposed to aircraft noise, each building is associated to the noisiest noise receiver point falling within the building itself or, if not present, on the grid surrounding the building.

For the assessment of buildings not containing dwellings and exposed to land-based noise sources, receiver points are placed at approximately 0,1 m in front of building façades. Reflections from the façade being considered shall be excluded from the calculation. The building is then associated to the noisiest receiver point on its façades.

Determination of the dwellings and people living in dwellings exposed to noise

For the assessment of the noise exposure of dwellings and the exposure of people living in dwellings, only residential buildings shall be considered. No dwellings or people shall be assigned to other buildings without residential use such as buildings exclusively used as schools, hospitals, office buildings or factories. The assignment of the dwellings, and people living in dwellings, to the residential buildings shall be based on the latest official data (depending on the Member State's relevant regulations).

The number of dwellings, and people living in dwellings, in residential buildings are important intermediate parameters for the estimation of the exposure to noise. Unfortunately, data on these parameters is not always available. Below, it is specified how these parameters can be derived from data more readily available.

Symbols used in the following are:

BA =	base area of the building
DFS =	dwellings floor space
DUFS =	dwellings unit floor space
H =	height of the building
FSI =	dwellings floor space per person living in dwellings
Dw =	number of dwellings
Inh =	number of people living in dwellings
NF =	number of floors
V =	volume of residential buildings

For the calculation of the number of dwellings, and people living in dwellings, either the following Case 1 procedure or the Case 2 procedure shall be used, depending on the availability of data.

Case 1: the data on the number of dwellings and people living in dwellings is available

1A:

The number of people living in dwellings is known or has been estimated on the basis of the number of dwelling units. In this case the number of people living in dwellings for a building is the sum of the number of people living in all dwelling units in the building:

$$Inh_{building} = \sum_{i=1}^n Inh_{dwelling_{unit_i}} \quad (2.8.1)$$

1B:

The number of dwellings or people living in dwellings is only known for entities larger than a building, e.g., enumeration areas, city blocks, districts or even an entire municipality. In this case the number of dwellings, and people living in dwellings, in a building is estimated based on the volume of the building:

$$Dw_{building} = \frac{V_{building}}{V_{total}} \times Dw_{total} \quad (2.8.2a)$$

$$Inh_{building} = \frac{V_{building}}{V_{total}} \times Inh_{total} \quad (2.8.2b)$$

The index "total" here refers to the respective entity considered. The volume of the building is the product of its base area and its height:

$$V_{building} = BA_{building} \times H_{building} \quad (2.8.3)$$

If the height of the building is not known, it shall be estimated based on the number of floors $NF_{building}$, assuming an average height per floor of 3 m:

$$H_{building} = NF_{building} \times 3m \quad (2.8.4)$$

If the number of floors is also not known, a default value for the number of floors, representative of the district or the borough, shall be used. The total volume of residential buildings in the entity considered V_{total} is calculated as the sum of the volumes of all residential buildings in the entity:

(2.8.5)

$$V_{total} = \sum_{i=1}^n V_{building_i} \quad (2.8.5)$$

Case 2: no data on the number of people living in dwellings is available

In this case, the number of people living in dwellings is estimated based on the average dwelling floor space per person living in dwellings FSI. If this parameter is not known, a default value shall be used.

2A:

The dwelling floor space is known on the basis of dwelling units.

In this case the number of people living in each dwelling unit is estimated as follows:

$$Inh_{dwelling_{unit_i}} = \frac{DUFS_i}{FSI} \quad (2.8.6)$$

The total number of people living in dwellings for the building can now be estimated as in Case 1A.

2B:

The dwelling floor space is known for the entire building, that is to say, the sum of the dwelling floor spaces of all dwelling units in the building is known.

In this case the number of people living in dwellings is estimated as follows:

$Inh_{building} = \frac{DFS_{building}}{FSI}$	(2.8.7)
---	---------

2C:

The dwelling floor space is known only for entities larger than a building, e.g., enumeration areas, city blocks, districts or even an entire municipality.

In this case the number of people living in dwellings for a building is estimated based on the volume of the building as described in Case 1B with the total number of people living in dwellings estimated as follows:

$Inh_{total} = \frac{DFS_{total}}{FSI}$	(2.8.8)
---	---------

2D:

The dwelling floor space is unknown.

In this case the number of people living in dwellings for a building is estimated as described in Case 2B with the dwelling floor space estimated as follows:

(2.8.9)

$DFS_{building} = BA_{building} \times 0,8 \times NF_{building}$	(2.8.9)
--	---------

The factor 0,8 is the conversion factor *gross floor area* → *dwelling floor space*. If a different factor is known to be representative of the area it shall be used instead and clearly documented. If the number of floors of the building is not known, it shall be estimated based on the height of the building, $H_{building}$, which typically results in a non-integer number of floors:

$NF_{building} = \frac{H_{building}}{3m}$	(2.8.10)
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If neither the height of the building nor the number of floors is known, a default value for the number of floors, representative of the district or the borough, shall be used.

Assigning noise assessment points to dwellings and people living in dwellings

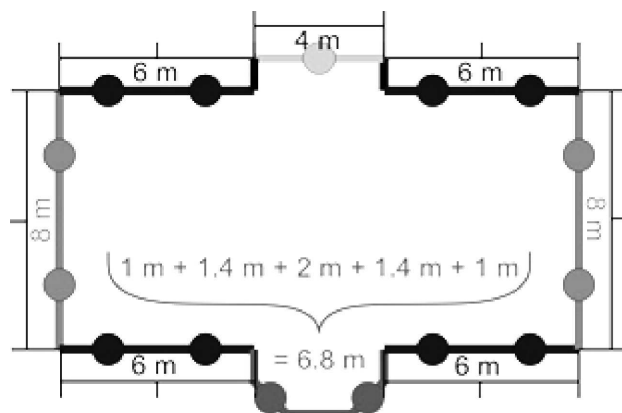
The assessment of the exposure of dwellings, and people living in dwellings, to noise is based on noise assessment points at $4 \pm 0,2$ m above the ground, corresponding to the receiver points as defined in 2.5, 2.6 and 2.7.

For the calculation of the number of dwellings, and people living in dwellings for aircraft noise, all dwellings, and people living in dwellings, within a building are associated to the noisiest noise receiver point falling within the building itself or, if not present, on the grid surrounding the building.

For the calculation of the number of dwellings, and people living in dwellings for land-based noise sources, receiver points are placed at approximately 0,1 m in front of building façades of residential buildings. Reflections from the façade being considered shall be excluded from the calculation. Either the following Case 1 procedure or the Case 2 procedure shall be used to locate the receiver points.

Case 1: façades split up in regular intervals on each façade

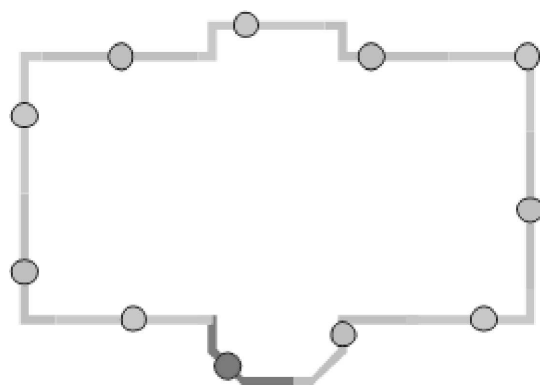
Figure 2.8.a

Example of location of receiver points around a building following Case 1 procedure

- (a) Segments of a length of more than 5 m are split up into regular intervals of the longest possible length but less than or equal to 5 m. Receiver points are placed in the middle of each regular interval.
- (b) Remaining segments above a length of 2,5 m are represented by one receiver point in the middle of each segment.
- (c) Remaining adjacent segments with a total length of more than 5 m are treated as polyline objects in a manner similar to that described in (a) and (b).

Case 2: façades split up at set distance from start of polygon

Figure 2.8.b

Example of location of receiver points around a building following Case 2 procedure

- (a) Façades are considered separately or are split up every 5 m from the start position onwards, with a receiver position placed at the halfway distance of the façade or the 5m segment
- (b) The remaining section has its receiver point in its mid-point.

Assigning dwellings and people living in dwellings to receiver points

Where information on the location of dwellings within building footprints is available, that dwelling and the people living in that dwelling are assigned to the receiver point at the most exposed façade of that dwelling. For example, for detached houses, for semi-detached and terrace houses, or apartment buildings, where the internal division of the building is known, or for buildings with a floor size that indicates a single dwelling per floor level, or for buildings with a floor size and height that indicates a single dwelling per building.

Where no information on the location of dwellings within building footprints as explained above is available, one of the two following methods shall be used, as appropriate, on a building by building basis to estimate the exposure to noise of the dwellings and people in dwellings within the buildings.

- (a) Available information shows that dwellings are arranged within an apartment building such that they have a single façade exposed to noise

In this case, the allocation of the number of dwellings, and people living in dwellings, to receiver points, shall be weighted by the length of the represented façade according to the procedure under either Case 1 or Case 2, so that the sum of all receiver points represents the total number of dwellings and people living in dwellings assigned to the building.

- (b) Available information shows that dwellings are arranged within an apartment building such that they have more than one façade exposed to noise, or no information is available on how many facades of the dwellings are exposed to noise.

In this case, for each building, the set of associated receiver locations shall be split into a lower and upper half based on the median * value of the calculated assessment levels for each building. In case of odd number of receiver points, the procedure is applied excluding the receiver location with the lowest noise level.

For each receiver point in the upper half of the data set, the number of dwellings, and people living in dwellings, shall be distributed equally, so that the sum of all receiver points in the upper half of the data set represents the total number of dwellings and people living in dwellings. No dwellings or people living in dwellings will be assigned to receivers in the lower half of the data set **.

* The medium value is the value separating the higher half (50 %) from the lower half (50 %) of a data set.

** The lower half of the data asset may be assimilated with the presence of relatively calm façades. In case it is known in advance, e.g. based on the location of buildings relative to the dominant noise sources, which receiver locations will give way to the highest / lowest noise levels, there is no need to calculate noise for the lower half.’.

(18) Appendix D is amended as follows:

- (a) the first sub-paragraph under Table D-1 is replaced by the following:

‘The attenuation coefficients in **Table D-1** may be assumed valid over reasonable ranges of temperature and humidity. However, to check whether adjustments may be necessary, SAE ARP-5534 should be used to calculate average atmospheric absorption coefficients for the average airport temperature T and relative humidity RH . Where, from a comparison of these with those in **Table D-1**, it is judged that adjustment is required the following methodology should be used.’;

- (b) in the third sub-paragraph under Table D-1, points 2 and 3 are replaced by the following:

‘2. Next the corrected spectrum is adjusted to each of the ten standard NPD distances d_i using attenuation rates for both (i) the SAE AIR-1845 atmosphere; and (ii) the user-specified atmosphere (based on SAE ARP-5534).

- (i) For the SAE AIR-1845 atmosphere:

$L_{n,ref}(d_i) = L_n(d_{ref}) - 20 \cdot \lg(d_i/d_{ref}) - \alpha_{n,ref} \cdot d_i$	(D-2)
--	-------

- (ii) For the user-specified atmosphere:

$L_{n,5534}(T, RH, d_i) = L_n(d_{ref}) - 20 \cdot \lg(d_i/d_{ref}) - \alpha_{n,5534}(T, RH) d_i$	(D-3)
--	-------

where $\alpha_{n,5534}$ is the coefficient of atmospheric absorption for the frequency band n (expressed in dB/m) calculated using SAE ARP-5534 with temperature T , and relative humidity RH .

3. At each NPD distance d_i the two spectra are A-weighted and decibel-summed to determine the resulting A-weighted levels $L_{A,5534}$ and $L_{A,ref}$ – which are then subtracted arithmetically:

$$\Delta L(T, RH, d_i) = L_{A,5534} - L_{A,ref} = 10 \cdot \lg \sum_{n=1}^{24} 10^{(L_{n,5534}(T, RH, d_i) - A_n)/10} - 10 \cdot \lg \sum_{n=1}^{24} 10^{(L_{n,ref}(d_i) - A_n)/10} \quad (D-4)'$$

(19) Appendix F is amended as follows:

(a) Table F-1 is replaced by the following:

Category	Coefficient	63	125	250	500	1 000	2 000	4 000	8 000
1	A_R	83,1	89,2	87,7	93,1	100,1	96,7	86,8	76,2
	B_R	30,0	41,5	38,9	25,7	32,5	37,2	39,0	40,0
	A_P	97,9	92,5	90,7	87,2	84,7	88,0	84,4	77,1
	B_P	-1,3	7,2	7,7	8,0	8,0	8,0	8,0	8,0
2	A_R	88,7	93,2	95,7	100,9	101,7	95,1	87,8	83,6
	B_R	30,0	35,8	32,6	23,8	30,1	36,2	38,3	40,1
	A_P	105,5	100,2	100,5	98,7	101,0	97,8	91,2	85,0
	B_P	-1,9	4,7	6,4	6,5	6,5	6,5	6,5	6,5
3	A_R	91,7	96,2	98,2	104,9	105,1	98,5	91,1	85,6
	B_R	30,0	33,5	31,3	25,4	31,8	37,1	38,6	40,6
	A_P	108,8	104,2	103,5	102,9	102,6	98,5	93,8	87,5
	B_P	0,0	3,0	4,6	5,0	5,0	5,0	5,0	5,0
4a	A_R	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
	B_R	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
	A_P	93,0	93,0	93,5	95,3	97,2	100,4	95,8	90,9
	B_P	4,2	7,4	9,8	11,6	15,7	18,9	20,3	20,6
4b	A_R	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
	B_R	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
	A_P	99,9	101,9	96,7	94,4	95,2	94,7	92,1	88,6
	B_P	3,2	5,9	11,9	11,6	11,5	12,6	11,1	12,0
5	A_R								
	B_R								
	A_P								
	B_P'								

[illegible]

Thin layer A	40	130	1	10,4	0,7	- 0,6	- 1,2	- 3,0	- 4,8	- 3,4	- 1,4	- 2,9
			2	13,8	5,4	3,9	- 0,4	- 1,8	- 2,1	- 0,7	- 0,2	0,5
			3	14,1	6,1	4,1	- 0,4	- 1,8	- 2,1	- 0,7	- 0,2	0,3
			4a/4b	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Thin layer B	40	130	1	6,8	- 1,2	- 1,2	- 0,3	- 4,9	- 7,0	- 4,8	- 3,2	- 1,8
			2	13,8	5,4	3,9	- 0,4	- 1,8	- 2,1	- 0,7	- 0,2	0,5
			3	14,1	6,1	4,1	- 0,4	- 1,8	- 2,1	- 0,7	- 0,2	0,3
			4a/4b	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0'

(20) Appendix G is amended as follows:

(a) in Table G-1, the second table is replaced by the following:

$T_{r,TR,i}$		
Wavelength	Rail Roughness	
	E	M
	EN ISO 3095:2013 (Well maintained and very smooth)	Average network (Normally maintained smooth)
2 000 mm	17,1	35,0
1 600 mm	17,1	31,0
1 250 mm	17,1	28,0
1 000 mm	17,1	25,0
800 mm	17,1	23,0
630 mm	17,1	20,0
500 mm	17,1	17,0
400 mm	17,1	13,5
315 mm	15,0	10,5
250 mm	13,0	9,0
200 mm	11,0	6,5
160 mm	9,0	5,5
125 mm	7,0	5,0
100 mm	4,9	3,5
80 mm	2,9	2,0
63 mm	0,9	0,1
50 mm	-1,1	- 0,2
40 mm	-3,2	- 0,3
31,5 mm	-5,0	- 0,8

25 mm	-5,6	- 3,0
20 mm	-6,2	- 5,0
16 mm	-6,8	- 7,0
12,5 mm	-7,4	- 8,0
10 mm	-8,0	- 9,0
8 mm	-8,6	- 10,0
6,3 mm	-9,2	- 12,0
5 mm	-9,8	- 13,0
4 mm	-10,4	- 14,0
3,15 mm	-11,0	- 15,0
2,5 mm	-11,6	- 16,0
2 mm	-12,2	- 17,0
1,6 mm	-12,8	- 18,0
1,25 mm	-13,4	- 19,0
1 mm	-14,0	- 19,0
0,8 mm	-14,0	- 19,0'

(b) Table G-2 is replaced by the following:

$A_{3,i}$					
1.1. Wave-length	Wheel load 50 kN – wheel diameter 360 mm	Wheel load 50 kN – wheel diameter 680 mm	Wheel load 50 kN – wheel diameter 920 mm	Wheel load 25 kN – wheel diameter 920 mm	Wheel load 100 kN – wheel diameter 920 mm
2 000 mm	0,0	0,0	0,0	0,0	0,0
1 600 mm	0,0	0,0	0,0	0,0	0,0
1 250 mm	0,0	0,0	0,0	0,0	0,0
1 000 mm	0,0	0,0	0,0	0,0	0,0
800 mm	0,0	0,0	0,0	0,0	0,0
630 mm	0,0	0,0	0,0	0,0	0,0
500 mm	0,0	0,0	0,0	0,0	0,0
400 mm	0,0	0,0	0,0	0,0	0,0
315 mm	0,0	0,0	0,0	0,0	0,0
250 mm	0,0	0,0	0,0	0,0	0,0
200 mm	0,0	0,0	0,0	0,0	0,0
160 mm	0,0	0,0	0,0	0,0	- 0,1
125 mm	0,0	0,0	- 0,1	0,0	- 0,2
100 mm	0,0	- 0,1	- 0,1	0,0	- 0,3
80 mm	- 0,1	- 0,2	- 0,3	- 0,1	- 0,6

63 mm	- 0,2	- 0,3	- 0,6	- 0,3	- 1,0
50 mm	- 0,3	- 0,7	- 1,1	- 0,5	- 1,8
40 mm	- 0,6	- 1,2	- 1,3	- 1,1	- 3,2
31,5 mm	- 1,0	- 2,0	- 3,5	- 1,8	- 5,4
25 mm	- 1,8	- 4,1	- 5,3	- 3,3	- 8,7
20 mm	- 3,2	- 6,0	- 8,0	- 5,3	- 12,2
16 mm	- 5,4	- 9,2	- 12,0	- 7,9	- 16,7
12,5 mm	- 8,7	- 13,8	- 16,8	- 12,8	- 17,7
10 mm	- 12,2	- 17,2	- 17,7	- 16,8	- 17,8
8 mm	- 16,7	- 17,7	- 18,0	- 17,7	- 20,7
6,3 mm	- 17,7	- 18,6	- 21,5	- 18,2	- 22,1
5 mm	- 17,8	- 21,5	- 21,8	- 20,5	- 22,8
4 mm	- 20,7	- 22,3	- 22,8	- 22,0	- 24,0
3,15 mm	- 22,1	- 23,1	- 24,0	- 22,8	- 24,5
2,5 mm	- 22,8	- 24,4	- 24,5	- 24,2	- 24,7
2 mm	- 24,0	- 24,5	- 25,0	- 24,5	- 27,0
1,6 mm	- 24,5	- 25,0	- 27,3	- 25,0	- 27,8
1,25 mm	- 24,7	- 28,0	- 28,1	- 27,4	- 28,6
1 mm	- 27,0	- 28,8	- 28,9	- 28,2	- 29,4
0,8 mm	- 27,8	- 29,6	- 29,7	- 29,0	- 30,2'

(c) the first table of Table G-3 is replaced by the following:

$T_{H,TR,i}$								
Frequency	Track base / Rail pad type							
	M/S	M/M	M/H	B/S	B/M	B/H	W	D
	Mono-block sleeper on soft rail pad	Mono-block sleeper on medium stiffness rail pad	Mono-block on hard rail pad	Bi-block sleeper on soft rail pad	Bi-block sleeper on medium stiffness rail pad	Bi-block sleeper on hard rail pad	Wooden sleepers	Direct fastening on bridges
50 Hz	53,3	50,9	50,1	50,9	50,0	49,8	44,0	75,4
63 Hz	59,3	57,8	57,2	56,6	56,1	55,9	51,0	77,4
80 Hz	67,2	66,5	66,3	64,3	64,1	64,0	59,9	81,4
100 Hz	75,9	76,8	77,2	72,3	72,5	72,5	70,8	87,1
125 Hz	79,2	80,9	81,6	75,4	75,8	75,9	75,1	88,0
160 Hz	81,8	83,3	84,0	78,5	79,1	79,4	76,9	89,7
200 Hz	84,2	85,8	86,5	81,8	83,6	84,4	77,2	83,4

250 Hz	88,6	90,0	90,7	86,6	88,7	89,7	80,9	87,7
315 Hz	91,0	91,6	92,1	89,1	89,6	90,2	85,3	89,8
400 Hz	94,5	93,9	94,3	91,9	89,7	90,2	92,5	97,5
500 Hz	97,0	95,6	95,8	94,5	90,6	90,8	97,0	99,0
630 Hz	99,2	97,4	97,0	97,5	93,8	93,1	98,7	100,8
800 Hz	104,0	101,7	100,3	104,0	100,6	97,9	102,8	104,9
1 000 Hz	107,1	104,4	102,5	107,9	104,7	101,1	105,4	111,8
1 250 Hz	108,3	106,0	104,2	108,9	106,3	103,4	106,5	113,9
1 600 Hz	108,5	106,8	105,4	108,8	107,1	105,4	106,4	115,5
2 000 Hz	109,7	108,3	107,1	109,8	108,8	107,7	107,5	114,9
2 500 Hz	110,0	108,9	107,9	110,2	109,3	108,5	108,1	118,2
3 150 Hz	110,0	109,1	108,2	110,1	109,4	108,7	108,4	118,3
4 000 Hz	110,0	109,4	108,7	110,1	109,7	109,1	108,7	118,4
5 000 Hz	110,3	109,9	109,4	110,3	110,0	109,6	109,1	118,9
6 300 Hz	110,0	109,9	109,7	109,9	109,8	109,6	109,1	117,5
8 000 Hz	110,1	110,3	110,4	110,0	110,0	109,9	109,5	117,9
10 000 Hz	110,6	111,0	111,4	110,4	110,5	110,6	110,2	118,6'

(d) Table G-3 is amended as follows:

— in column 1 of section 'L_{H, VEH, i}':

the 11th row is replaced by the following: '315 Hz';

the 21st row is replaced by the following: '3 150 Hz';

the 24th row is replaced by the following: '6 300 Hz';

— in column 1 of section 'L_{H, VEH, SUP, i}':

the 11th row is replaced by the following: '315 Hz';

the 21st row is replaced by the following: '3 150 Hz';

the 24th row is replaced by the following: '6 300 Hz';

(e) Table G-4 is replaced by the following:

L _{R, IMPACT, i}	
Wavelength	Single switch/joint/crossing/100 m
2 000 mm	22,0
1 600 mm	22,0
1 250 mm	22,0
1 000 mm	22,0
800 mm	22,0
630 mm	20,0
500 mm	16,0
400 mm	15,0

315 mm	14,0
250 mm	15,0
200 mm	14,0
160 mm	12,0
125 mm	11,0
100 mm	10,0
80 mm	9,0
63 mm	8,0
50 mm	6,0
40 mm	3,0
31,5 mm	2,0
25 mm	- 3,0
20 mm	- 8,0
16 mm	- 13,0
12,5 mm	- 17,0
10 mm	- 19,0
8 mm	- 22,0
6,3 mm	- 25,0
5 mm	- 26,0
4 mm	- 32,0
3,15 mm	- 35,0
2,5 mm	- 40,0
2 mm	- 43,0
1,6 mm	- 45,0
1,25 mm	- 47,0
1 mm	- 49,0
0,8 mm	- 50,0'

(f) in Table G-5:

the 1st column, 12th row is replaced by the following: '315 Hz';

the 1st column, 22nd row is replaced by the following: '3 150 Hz';

the 1st column, 25th row is replaced by the following: '6 300 Hz';

the 4th column, 25th row is replaced by the following: '81,4';

the 5th column, 25th row is replaced by the following: '80,7';

(g) in Table G-6, in column 1:

the 11th row is replaced by the following: '315 Hz';

the 21st row is replaced by the following: '3 150 Hz';

the 24th row is replaced by the following: '6 300 Hz';

(h) Table G-7 is replaced by the following:

$L_{H,bridge,i}$		
Frequency	+10 dB(A)	+15 dB(A)
50 Hz	85,2	90,1
63 Hz	87,1	92,1
80 Hz	91,0	96,0
100 Hz	94,0	99,5
125 Hz	94,4	99,9
160 Hz	96,0	101,5
200 Hz	92,5	99,6
250 Hz	96,7	103,8
315 Hz	97,4	104,5
400 Hz	99,4	106,5
500 Hz	100,7	107,8
630 Hz	102,5	109,6
800 Hz	107,1	116,1
1 000 Hz	109,8	118,8
1 250 Hz	112,0	120,9
1 600 Hz	107,2	109,5
2 000 Hz	106,8	109,1
2 500 Hz	107,3	109,6
3 150 Hz	99,3	102,0
4 000 Hz	91,4	94,1
5 000 Hz	86,9	89,6
6 300 Hz	79,7	83,6
8 000 Hz	75,1	79,0
10 000 Hz	70,8	74,7'

(21) Appendix I is amended as follows:

(a) the title of the appendix is replaced by the following:

'Appendix I: Database for aircraft source – Aircraft Noise and Performance (ANP) data';

(b) in Table I-1, the rows starting with the row

F10062	A	D-42	0	0	0,4731	0,1565'
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up to the last row of the table are replaced by the following:

'737800	A	A_00				0,0596977
737800	A	A_01				0,066122
737800	A	A_05				0,078996

737800	A	A_15				0,111985
737800	A	A_30			0,383611	0,117166
7378MAX	A	A_00	0	0	0	0,076682
7378MAX	A	A_00				0,056009
7378MAX	A	A_01	0	0	0	0,091438
7378MAX	A	A_01				0,066859
7378MAX	A	A_05	0	0	0	0,106627
7378MAX	A	A_05				0,077189
7378MAX	A	A_15	0	0	0,395117	0,165812
7378MAX	A	A_15				0,106525
7378MAX	A	A_30			0,375612	0,116638
7378MAX	A	A_40	0	0	0,375646	0,189672
7378MAX	D	D_00	0	0	0	0,074217
7378MAX	D	D_00				0,05418
7378MAX	D	D_01	0	0	0	0,085464
7378MAX	D	D_01				0,062526
7378MAX	D	D_05	0,00823	0,41332	0	0,101356
7378MAX	D	D_05	0,0079701	0,40898		0,074014
A350-941	A	A_1_U	0	0	0	0,05873
A350-941	A	A_1_U				0,056319
A350-941	A	A_2_D	0	0	0	0,083834
A350-941	A	A_2_D				0,081415
A350-941	A	A_2_U	0	0	0	0,06183
A350-941	A	A_2_U				0,059857
A350-941	A	A_3_D	0	0	0,219605	0,092731
A350-941	A	A_3_D			0,225785	0,092557
A350-941	A	A_FULL_D	0	0	0,214867	0,106381
A350-941	A	A_FULL_D			0,214862	0,106058
A350-941	A	A_ZERO	0	0	0	0,049173
A350-941	A	A_ZERO				0,048841
A350-941	D	D_1	0	0	0	0,052403
A350-941	D	D_1_U				0,058754
A350-941	D	D_1+F	0,00325	0,234635	0	0,06129
A350-941	D	D_1+F_D	0,002722	0,233179		0,098533

A350-941	D	D_1+F_U				0,062824
A350-941	D	D_ZERO	0	0	0	0,048142
A350-941	D	D_ZERO				0,048126
ATR72	A	15-A-G				0,0803
ATR72	A	33-A-G			0,55608	0,105
ATR72	A	ZERO-A				0,09027
ATR72	D	15	0,013155	0,538		0,08142
ATR72	D	INTR				0,07826
ATR72	D	ZERO				0,0708
F10062	A	D-42	0	0	0,4731	0,1565
F10062	A	INT2				0,0904
F10062	A	TO				0,0683
F10062	A	U-INT				0,1124
F10062	D	INT2				0,0904
F10062	D	TO	0,0122	0,5162		0,0683
F10062	D	ZERO				0,0683
F10065	A	D-42			0,4731	0,1565
F10065	A	INT2				0,0911
F10065	A	TO				0,0693
F10065	A	U-INT				0,1129
F10065	D	INT2				0,0911
F10065	D	TO	0,0123	0,521		0,0693
F10065	D	ZERO				0,0693
F28MK2	A	D-42			0,5334	0,1677
F28MK2	A	INT2				0,1033
F28MK2	A	U-INTR				0,1248
F28MK2	A	ZERO				0,0819
F28MK2	D	6	0,0171	0,6027		0,0793
F28MK2	D	INT2				0,1033
F28MK2	D	ZERO				0,0819
F28MK4	A	D-42			0,5149	0,1619
F28MK4	A	INT2				0,0971
F28MK4	A	U-INTR				0,1187
F28MK4	A	ZERO				0,0755
F28MK4	D	6	0,01515	0,5731		0,0749
F28MK4	D	INT2				0,0971

F28MK4	D	ZERO				0,0755
FAL20	A	D-25			0,804634	0,117238
FAL20	A	D-40			0,792624	0,136348
FAL20	A	INTR				0,084391
FAL20	A	ZERO				0,07
FAL20	D	10	0,035696	0,807797		0,098781
FAL20	D	INTR				0,084391
FAL20	D	ZERO				0,07
GII	A	L-0-U				0,0751
GII	A	L-10-U				0,0852
GII	A	L-20-D				0,1138
GII	A	L-39-D			0,5822	0,1742
GII	D	T-0-U				0,0814
GII	D	T-10-U				0,0884
GII	D	T-20-D	0,02	0,634		0,1159
GIIB	A	L-0-U				0,0722
GIIB	A	L-10-U				0,0735
GIIB	A	L-20-D				0,1091
GIIB	A	L-39-D			0,562984	0,1509
GIIB	D	T-0-U				0,0738
GIIB	D	T-10-U				0,0729
GIIB	D	T-20-D	0,0162	0,583		0,1063
GIV	A	L-0-U				0,06
GIV	A	L-20-D				0,1063
GIV	A	L-39-D			0,5805	0,1403
GIV	D	T-0-U				0,0586
GIV	D	T-10-U				0,0666
GIV	D	T-20-D	0,0146	0,5798		0,1035
GIV	D	T-20-U				0,0797
GV	A	L-0-U				0,0617
GV	A	L-20-D				0,0974
GV	A	L-20-U				0,0749
GV	A	L-39-D			0,4908	0,1328
GV	D	T-0-U				0,058
GV	D	T-10-U				0,0606

GV	D	T-20-D	0,01178	0,516		0,0953
GV	D	T-20-U				0,0743
HS748A	A	D-30			0,45813	0,13849
HS748A	A	D-INTR				0,106745
HS748A	A	INTR				0,088176
HS748A	A	ZERO				0,075
HS748A	D	INTR				0,088176
HS748A	D	TO	0,012271	0,542574		0,101351
HS748A	D	ZERO				0,075
IA1125	A	D-40			0,967478	0,136393
IA1125	A	D-INTR				0,118618
IA1125	A	INTR				0,085422
IA1125	A	ZERO				0,07
IA1125	D	12	0,040745	0,963488		0,100843
IA1125	D	INTR				0,085422
IA1125	D	ZERO				0,07
L1011	A	10				0,093396
L1011	A	D-33			0,286984	0,137671
L1011	A	D-42			0,256389	0,155717
L1011	A	ZERO				0,06243
L1011	D	10	0,004561	0,265314		0,093396
L1011	D	22	0,004759	0,251916		0,105083
L1011	D	INTR				0,07959
L1011	D	ZERO				0,06243
L10115	A	10				0,093396
L10115	A	D-33			0,262728	0,140162
L10115	A	D-42			0,256123	0,155644
L10115	A	ZERO				0,06243
L10115	D	10	0,004499	0,265314		0,093396
L10115	D	22	0,004695	0,251916		0,105083
L10115	D	INTR				0,07959
L10115	D	ZERO				0,06243
L188	A	D-100			0,436792	0,174786
L188	A	D-78-%			0,456156	0,122326
L188	A	INTR				0,120987

L188	A	ZERO				0,082
L188	D	39-%	0,009995	0,420533		0,142992
L188	D	78-%	0,010265	0,404302		0,159974
L188	D	INTR				0,120987
L188	D	ZERO				0,082
LEAR25	A	10				0,09667
LEAR25	A	D-40			1,28239	0,176632
LEAR25	A	D-INTR				0,149986
LEAR25	A	ZERO				0,07
LEAR25	D	10				0,09667
LEAR25	D	20	0,082866	1,27373		0,12334
LEAR25	D	ZERO				0,07
LEAR35	A	10				0,089112
LEAR35	A	D-40			1,08756	0,150688
LEAR35	A	D-INTR				0,129456
LEAR35	A	ZERO				0,07
LEAR35	D	10				0,089112
LEAR35	D	20	0,043803	1,05985		0,108224
LEAR35	D	ZERO				0,07
MD11GE	D	10	0,003812	0,2648		0,0843
MD11GE	D	15	0,003625	0,2578		0,0891
MD11GE	D	20	0,003509	0,2524		0,0947
MD11GE	D	25	0,003443	0,2481		0,1016
MD11GE	D	0/EXT				0,0692
MD11GE	D	0/RET				0,0551
MD11GE	D	ZERO				0,0551
MD11PW	D	10	0,003829	0,265		0,08425
MD11PW	D	15	0,003675	0,2576		0,08877
MD11PW	D	20	0,003545	0,2526		0,09472
MD11PW	D	25	0,003494	0,2487		0,1018
MD11PW	D	0/EXT				0,0691
MD11PW	D	0/RET				0,05512
MD11PW	D	ZERO				0,05512
MD81	D	11	0,009276	0,4247		0,07719
MD81	D	INT1				0,07643
MD81	D	INT2				0,06313

MD81	D	INT3				0,06156
MD81	D	INT4				0,06366
MD81	D	T_15	0,009369	0,420798		0,0857
MD81	D	T_INT				0,0701
MD81	D	T_ZERO				0,061
MD81	D	ZERO				0,06761
MD82	D	11	0,009248	0,4236		0,07969
MD82	D	INT1				0,07625
MD82	D	INT2				0,06337
MD82	D	INT3				0,06196
MD82	D	INT4				0,0634
MD82	D	T_15	0,009267	0,420216		0,086
MD82	D	T_INT				0,065
MD82	D	T_ZERO				0,061
MD82	D	ZERO				0,06643
MD83	D	11	0,009301	0,4227		0,0798
MD83	D	INT1				0,07666
MD83	D	INT2				0,0664
MD83	D	INT3				0,06247
MD83	D	INT4				0,06236
MD83	D	T_15	0,009384	0,420307		0,086
MD83	D	T_INT				0,0664
MD83	D	T_ZERO				0,0611
MD83	D	ZERO				0,06573
MD9025	A	D-28			0,4118	0,1181
MD9025	A	D-40			0,4003	0,1412
MD9025	A	U-0			0,4744	0,0876
MD9025	D	EXT/06	0,010708	0,458611		0,070601
MD9025	D	EXT/11	0,009927	0,441118		0,073655
MD9025	D	EXT/18	0,009203	0,421346		0,083277
MD9025	D	EXT/24	0,008712	0,408301		0,090279
MD9025	D	RET/0				0,05186
MD9028	A	D-28			0,4118	0,1181
MD9028	A	D-40			0,4003	0,1412
MD9028	A	U-0			0,4744	0,0876

MD9028	D	EXT/06	0,010993	0,463088		0,070248
MD9028	D	EXT/11	0,010269	0,446501		0,072708
MD9028	D	EXT/18	0,009514	0,426673		0,082666
MD9028	D	EXT/24	0,008991	0,413409		0,090018
MD9028	D	RET/0				0,05025
MU3001	A	1				0,08188
MU3001	A	D-30			1,07308	0,147487
MU3001	A	D-INTR				0,114684
MU3001	A	ZERO				0,07
MU3001	D	1	0,065703	1,1529		0,08188
MU3001	D	10	0,055318	1,0729		0,09285
MU3001	D	ZERO				0,07
PA30	A	27-A			1,316667	0,104586
PA30	A	ZERO-A				0,078131
PA30	D	15-D	0,100146	1,166667		0,154071
PA30	D	ZERO-D				0,067504
PA42	A	30-DN			1,09213	0,14679
PA42	A	ZERO-A				0,087856
PA42	D	ZER-DN	0,06796	1,011055		0,08088
PA42	D	ZERO				0,087856
PA42	D	ZERO-C				0,139096
PA42	D	ZERO-T				0,07651
SD330	A	D-15			0,746802	0,109263
SD330	A	D-35			0,702872	0,143475
SD330	A	INTR				0,106596
SD330	A	ZERO				0,075
SD330	D	10	0,031762	0,727556		0,138193
SD330	D	INTR				0,106596
SD330	D	ZERO				0,075
SF340	A	5				0,105831
SF340	A	D-35			0,75674	0,147912
SF340	A	D-INTR				0,111456
SF340	A	ZERO				0,075
SF340	D	5				0,105831
SF340	D	15	0,026303	0,746174		0,136662
SF340	D	ZERO				0,075'

(c) in Table I-2, the rows corresponding to the AIRCFTID 737700 and 737800 are correspondingly replaced by:

'737700	Boeing 737-700/ CFM56-7B24	Jet	2	Large	Commercial	154 500	129 200	4 445	24 000	3	CF567B	CNT (lb)	206	104	Wing
737800	Boeing 737-800 / CFM56-7B26	Jet	2	Large	Commercial	174 200	146 300	5 435	26 300	3	CF567B	CNT (lb)	206	104	Wing'

(d) in Table I-2, the following rows are added:

'7378MAX	Boeing 737 MAX 8 / CFM Leap1B-27	Jet	2	Large	Commercial	181 200	152 800	4 965	26 400	4	7378MAX	CNT (lb)	216	103	Wing
A350-941	Airbus A350-941 / RR Trent XWB-84	Jet	2	Heavy	Commercial	610 681	456 356	6 558	84 200	4	A350-941	CNT (lb)	239	139	Wing
ATR72	Avions de Transport Regional ATR 72-212A / PW127F	Turbo- prop	2	Large	Commercial	50 710	49 270	3 360	7 587	4	ATR72	CNT (lb)	240	140	Prop'

(e) in Table I-3, the following rows are added:

'737800	DEFAULT	1	Descend-Idle	A_00	6 000	248,93	3			
737800	DEFAULT	2	Level-Idle	A_00	3 000	249,5			25 437	
737800	DEFAULT	3	Level-Idle	A_01	3 000	187,18			3 671	
737800	DEFAULT	4	Level-Idle	A_05	3 000	174,66			5 209	
737800	DEFAULT	5	Descend-Idle	A_15	3 000	151,41	3			
737800	DEFAULT	6	Descend	A_30	2 817	139,11	3			
737800	DEFAULT	7	Land	A_30				393,8		
737800	DEFAULT	8	Decelerate	A_30		139			3 837,5	40

737800	DEFAULT	9	Decelerate	A_30		30			0	10
737MAX8	DEFAULT	1	Descend-Idle	A_00	6 000	249,2	3			
737MAX8	DEFAULT	2	Level-Idle	A_00	3 000	249,7			24 557	
737MAX8	DEFAULT	3	Level-Idle	A_01	3 000	188,5			4 678	
737MAX8	DEFAULT	4	Level-Idle	A_05	3 000	173,7			4 907	
737MAX8	DEFAULT	5	Descend-Idle	A_15	3 000	152	3			
737MAX8	DEFAULT	6	Descend	A_30	2 817	139	3			
737MAX8	DEFAULT	7	Land	A_30				393,8		
737MAX8	DEFAULT	8	Decelerate	A_30		139			3 837,5	40
737MAX8	DEFAULT	9	Decelerate	A_30		30			0	10
A350-941	DEFAULT1	1	Descend-Idle	A_ZERO	6 000	250	2,7-4			
A350-941	DEFAULT1	2	Level-Idle	A_ZERO	3 000	250			26 122	
A350-941	DEFAULT1	3	Level-Idle	A_1_U	3 000	188,6			6 397,6	
A350-941	DEFAULT1	4	Descend-Idle	A_1_U	3 000	168,4	3			
A350-941	DEFAULT1	5	Descend-Idle	A_2_D	2 709	161,9	3			
A350-941	DEFAULT1	6	Descend-Idle	A_3_D	2 494	155,2	3			
A350-941	DEFAULT1	7	Descend	A_FULL_D	2 180	137,5	3			
A350-941	DEFAULT1	8	Descend	A_FULL_D	50	137,5	3			
A350-941	DEFAULT1	9	Land	A_FULL_D				556,1		
A350-941	DEFAULT1	10	Decelerate	A_FULL_D		137,5			5 004,9	10

A350-941	DEFAULT1	11	Decelerate	A_FULL_D		30			0	10
A350-941	DEFAULT2	1	Descend-Idle	A_ZERO	6 000	250	2,7-4			
A350-941	DEFAULT2	2	Level-Idle	A_ZERO	3 000	250			26 122	
A350-941	DEFAULT2	3	Level	A_1_U	3 000	188,6			20 219,8	
A350-941	DEFAULT2	4	Level-Idle	A_1_U	3 000	188,6			6 049,9	
A350-941	DEFAULT2	5	Descend-Idle	A_1_U	3 000	168,3	3			
A350-941	DEFAULT2	6	Descend-Idle	A_2_D	2 709	161,8	3			
A350-941	DEFAULT2	7	Descend	A_FULL_D	2 180	137,5	3			
A350-941	DEFAULT2	8	Descend	A_FULL_D	50	137,5	3			
A350-941	DEFAULT2	9	Land	A_FULL_D				556,1		
A350-941	DEFAULT2	10	Decelerate	A_FULL_D		137,5			5 004,9	10
A350-941	DEFAULT2	11	Decelerate	A_FULL_D		30			0	10
ATR72	DEFAULT	1	Descend	ZERO-A	6 000	238	3			
ATR72	DEFAULT	2	Level-Decel	ZERO-A	3 000	238			17 085	
ATR72	DEFAULT	3	Level-Decel	15-A-G	3 000	158,3			3 236	
ATR72	DEFAULT	4	Level	15-A-G	3 000	139			3 521	
ATR72	DEFAULT	5	Level	33-A-G	3 000	139			3 522	
ATR72	DEFAULT	6	Descend-Decel	33-A-G	3 000	139	3			
ATR72	DEFAULT	7	Descend	33-A-G	2 802	117,1	3			
ATR72	DEFAULT	8	Descend	33-A-G	50	117,1	3			
ATR72	DEFAULT	9	Land	33-A-G				50		
ATR72	DEFAULT	10	Decelerate	33-A-G		114,2			1 218	75,9
ATR72	DEFAULT	11	Decelerate	33-A-G		30			0	5,7'

(f) in Table I-4 (part 1), the following rows are added:

737MAX8	DEFAULT	1	1	Takeoff	MaxTakeoff	D_05				
737MAX8	DEFAULT	1	2	Climb	MaxTakeoff	D_05	1 000			
737MAX8	DEFAULT	1	3	Accelerate	MaxClimb	D_05		1 336	174	
737MAX8	DEFAULT	1	4	Accelerate	MaxClimb	D_01		1 799	205	
737MAX8	DEFAULT	1	5	Climb	MaxClimb	D_00	3 000			
737MAX8	DEFAULT	1	6	Accelerate	MaxClimb	D_00		1 681	250	
737MAX8	DEFAULT	1	7	Climb	MaxClimb	D_00	5 500			
737MAX8	DEFAULT	1	8	Climb	MaxClimb	D_00	7 500			
737MAX8	DEFAULT	1	9	Climb	MaxClimb	D_00	10 000			
737MAX8	DEFAULT	2	1	Takeoff	MaxTakeoff	D_05				
737MAX8	DEFAULT	2	2	Climb	MaxTakeoff	D_05	1 000			
737MAX8	DEFAULT	2	3	Accelerate	MaxClimb	D_05		1 284	176	
737MAX8	DEFAULT	2	4	Accelerate	MaxClimb	D_01		1 651	208	
737MAX8	DEFAULT	2	5	Climb	MaxClimb	D_00	3 000			
737MAX8	DEFAULT	2	6	Accelerate	MaxClimb	D_00		1 619	250	
737MAX8	DEFAULT	2	7	Climb	MaxClimb	D_00	5 500			
737MAX8	DEFAULT	2	8	Climb	MaxClimb	D_00	7 500			
737MAX8	DEFAULT	2	9	Climb	MaxClimb	D_00	10 000			
737MAX8	DEFAULT	3	1	Takeoff	MaxTakeoff	D_05				
737MAX8	DEFAULT	3	2	Climb	MaxTakeoff	D_05	1 000			
737MAX8	DEFAULT	3	3	Accelerate	MaxClimb	D_05		1 229	177	
737MAX8	DEFAULT	3	4	Accelerate	MaxClimb	D_01		1 510	210	
737MAX8	DEFAULT	3	5	Climb	MaxClimb	D_00	3 000			
737MAX8	DEFAULT	3	6	Accelerate	MaxClimb	D_00		1 544	250	
737MAX8	DEFAULT	3	7	Climb	MaxClimb	D_00	5 500			

737MAX8	DEFAULT	3	8	Climb	MaxClimb	D_00	7 500			
737MAX8	DEFAULT	3	9	Climb	MaxClimb	D_00	10 000			
737MAX8	DEFAULT	4	1	Takeoff	MaxTakeoff	D_05				
737MAX8	DEFAULT	4	2	Climb	MaxTakeoff	D_05	1 000			
737MAX8	DEFAULT	4	3	Accelerate	MaxClimb	D_05		1 144	181	
737MAX8	DEFAULT	4	4	Accelerate	MaxClimb	D_01		1 268	213	
737MAX8	DEFAULT	4	5	Climb	MaxClimb	D_00	3 000			
737MAX8	DEFAULT	4	6	Accelerate	MaxClimb	D_00		1 414	250	
737MAX8	DEFAULT	4	7	Climb	MaxClimb	D_00	5 500			
737MAX8	DEFAULT	4	8	Climb	MaxClimb	D_00	7 500			
737MAX8	DEFAULT	4	9	Climb	MaxClimb	D_00	10 000			
737MAX8	DEFAULT	5	1	Takeoff	MaxTakeoff	D_05				
737MAX8	DEFAULT	5	2	Climb	MaxTakeoff	D_05	1 000			
737MAX8	DEFAULT	5	3	Accelerate	MaxClimb	D_05		1 032	184	
737MAX8	DEFAULT	5	4	Accelerate	MaxClimb	D_01		1 150	217	
737MAX8	DEFAULT	5	5	Climb	MaxClimb	D_00	3 000			
737MAX8	DEFAULT	5	6	Accelerate	MaxClimb	D_00		1 292	250	
737MAX8	DEFAULT	5	7	Climb	MaxClimb	D_00	5 500			
737MAX8	DEFAULT	5	8	Climb	MaxClimb	D_00	7 500			
737MAX8	DEFAULT	5	9	Climb	MaxClimb	D_00	10 000			
737MAX8	DEFAULT	6	1	Takeoff	MaxTakeoff	D_05				
737MAX8	DEFAULT	6	2	Climb	MaxTakeoff	D_05	1 000			
737MAX8	DEFAULT	6	3	Accelerate	MaxClimb	D_05		1 001	185	
737MAX8	DEFAULT	6	4	Accelerate	MaxClimb	D_01		1 120	219	
737MAX8	DEFAULT	6	5	Climb	MaxClimb	D_00	3 000			
737MAX8	DEFAULT	6	6	Accelerate	MaxClimb	D_00		1 263	250	

737MAX8	DEFAULT	6	7	Climb	MaxClimb	D_00	5 500			
737MAX8	DEFAULT	6	8	Climb	MaxClimb	D_00	7 500			
737MAX8	DEFAULT	6	9	Climb	MaxClimb	D_00	10 000			
737MAX8	DEFAULT	M	1	Takeoff	MaxTakeoff	D_05				
737MAX8	DEFAULT	M	2	Climb	MaxTakeoff	D_05	1 000			
737MAX8	DEFAULT	M	3	Accelerate	MaxClimb	D_05		951	188	
737MAX8	DEFAULT	M	4	Accelerate	MaxClimb	D_01		1 058	221	
737MAX8	DEFAULT	M	5	Climb	MaxClimb	D_00	3 000			
737MAX8	DEFAULT	M	6	Accelerate	MaxClimb	D_00		1 196	250	
737MAX8	DEFAULT	M	7	Climb	MaxClimb	D_00	5 500			
737MAX8	DEFAULT	M	8	Climb	MaxClimb	D_00	7 500			
737MAX8	DEFAULT	M	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_A	1	1	Takeoff	MaxTakeoff	D_05				
737MAX8	ICAO_A	1	2	Climb	MaxTakeoff	D_05	1 500			
737MAX8	ICAO_A	1	3	Climb	MaxClimb	D_05	3 000			
737MAX8	ICAO_A	1	4	Accelerate	MaxClimb	D_05		1 300	174	
737MAX8	ICAO_A	1	5	Accelerate	MaxClimb	D_01		1 667	205	
737MAX8	ICAO_A	1	6	Accelerate	MaxClimb	D_00		2 370	250	
737MAX8	ICAO_A	1	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_A	1	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_A	1	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_A	2	1	Takeoff	MaxTakeoff	D_05				
737MAX8	ICAO_A	2	2	Climb	MaxTakeoff	D_05	1 500			
737MAX8	ICAO_A	2	3	Climb	MaxClimb	D_05	3 000			
737MAX8	ICAO_A	2	4	Accelerate	MaxClimb	D_05		1 243	174	
737MAX8	ICAO_A	2	5	Accelerate	MaxClimb	D_01		1 524	207	

737MAX8	ICAO_A	2	6	Accelerate	MaxClimb	D_00		2 190	250	
737MAX8	ICAO_A	2	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_A	2	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_A	2	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_A	3	1	Takeoff	MaxTakeoff	D_05				
737MAX8	ICAO_A	3	2	Climb	MaxTakeoff	D_05	1 500			
737MAX8	ICAO_A	3	3	Climb	MaxClimb	D_05	3 000			
737MAX8	ICAO_A	3	4	Accelerate	MaxClimb	D_05		1 190	176	
737MAX8	ICAO_A	3	5	Accelerate	MaxClimb	D_01		1 331	210	
737MAX8	ICAO_A	3	6	Accelerate	MaxClimb	D_00		2 131	250	
737MAX8	ICAO_A	3	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_A	3	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_A	3	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_A	4	1	Takeoff	MaxTakeoff	D_05				
737MAX8	ICAO_A	4	2	Climb	MaxTakeoff	D_05	1 500			
737MAX8	ICAO_A	4	3	Climb	MaxClimb	D_05	3 000			
737MAX8	ICAO_A	4	4	Accelerate	MaxClimb	D_05		1 098	180	
737MAX8	ICAO_A	4	5	Accelerate	MaxClimb	D_01		1 221	211	
737MAX8	ICAO_A	4	6	Accelerate	MaxClimb	D_00		1 883	250	
737MAX8	ICAO_A	4	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_A	4	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_A	4	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_A	5	1	Takeoff	MaxTakeoff	D_05				
737MAX8	ICAO_A	5	2	Climb	MaxTakeoff	D_05	1 500			
737MAX8	ICAO_A	5	3	Climb	MaxClimb	D_05	3 000			
737MAX8	ICAO_A	5	4	Accelerate	MaxClimb	D_05		988	183	

737MAX8	ICAO_A	5	5	Accelerate	MaxClimb	D_01		1 101	216	
737MAX8	ICAO_A	5	6	Accelerate	MaxClimb	D_00		1 730	250	
737MAX8	ICAO_A	5	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_A	5	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_A	5	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_A	6	1	Takeoff	MaxTakeoff	D_05				
737MAX8	ICAO_A	6	2	Climb	MaxTakeoff	D_05	1 500			
737MAX8	ICAO_A	6	3	Climb	MaxClimb	D_05	3 000			
737MAX8	ICAO_A	6	4	Accelerate	MaxClimb	D_05		964	185	
737MAX8	ICAO_A	6	5	Accelerate	MaxClimb	D_01		1 073	217	
737MAX8	ICAO_A	6	6	Accelerate	MaxClimb	D_00		1 588	250	
737MAX8	ICAO_A	6	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_A	6	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_A	6	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_A	M	1	Takeoff	MaxTakeoff	D_05				
737MAX8	ICAO_A	M	2	Climb	MaxTakeoff	D_05	1 500			
737MAX8	ICAO_A	M	3	Climb	MaxClimb	D_05	3 000			
737MAX8	ICAO_A	M	4	Accelerate	MaxClimb	D_05		911	187	
737MAX8	ICAO_A	M	5	Accelerate	MaxClimb	D_01		1 012	220	
737MAX8	ICAO_A	M	6	Accelerate	MaxClimb	D_00		1 163	250	
737MAX8	ICAO_A	M	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_A	M	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_A	M	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_B	1	1	Takeoff	MaxTakeoff	D_05				
737MAX8	ICAO_B	1	2	Climb	MaxTakeoff	D_05	1 000			
737MAX8	ICAO_B	1	3	Accelerate	MaxTakeoff	D_01		1 734	178	

737MAX8	ICAO_B	1	4	Accelerate	MaxTakeoff	D_00		2 595	205	
737MAX8	ICAO_B	1	5	Climb	MaxClimb	D_00	3 000			
737MAX8	ICAO_B	1	6	Accelerate	MaxClimb	D_00		1 671	250	
737MAX8	ICAO_B	1	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_B	1	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_B	1	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_B	2	1	Takeoff	MaxTakeoff	D_05				
737MAX8	ICAO_B	2	2	Climb	MaxTakeoff	D_05	1 000			
737MAX8	ICAO_B	2	3	Accelerate	MaxTakeoff	D_01		1 682	179	
737MAX8	ICAO_B	2	4	Accelerate	MaxTakeoff	D_00		2 477	208	
737MAX8	ICAO_B	2	5	Climb	MaxClimb	D_00	3 000			
737MAX8	ICAO_B	2	6	Accelerate	MaxClimb	D_00		1 610	250	
737MAX8	ICAO_B	2	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_B	2	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_B	2	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_B	3	1	Takeoff	MaxTakeoff	D_05				
737MAX8	ICAO_B	3	2	Climb	MaxTakeoff	D_05	1 000			
737MAX8	ICAO_B	3	3	Accelerate	MaxTakeoff	D_01		1 616	180	
737MAX8	ICAO_B	3	4	Accelerate	MaxTakeoff	D_00		2 280	210	
737MAX8	ICAO_B	3	5	Climb	MaxClimb	D_00	3 000			
737MAX8	ICAO_B	3	6	Accelerate	MaxClimb	D_00		1 545	250	
737MAX8	ICAO_B	3	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_B	3	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_B	3	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_B	4	1	Takeoff	MaxTakeoff	D_05				
737MAX8	ICAO_B	4	2	Climb	MaxTakeoff	D_05	1 000			

737MAX8	ICAO_B	4	3	Accelerate	MaxTakeoff	D_01		1 509	184	
737MAX8	ICAO_B	4	4	Accelerate	MaxTakeoff	D_00		2 103	214	
737MAX8	ICAO_B	4	5	Climb	MaxClimb	D_00	3 000			
737MAX8	ICAO_B	4	6	Accelerate	MaxClimb	D_00		1 589	250	
737MAX8	ICAO_B	4	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_B	4	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_B	4	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_B	5	1	Takeoff	MaxTakeoff	D_05				
737MAX8	ICAO_B	5	2	Climb	MaxTakeoff	D_05	1 000			
737MAX8	ICAO_B	5	3	Accelerate	MaxTakeoff	D_01		1 388	188	
737MAX8	ICAO_B	5	4	Accelerate	MaxTakeoff	D_00		1 753	220	
737MAX8	ICAO_B	5	5	Climb	MaxClimb	D_00	3 000			
737MAX8	ICAO_B	5	6	Accelerate	MaxClimb	D_00		1 295	250	
737MAX8	ICAO_B	5	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_B	5	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_B	5	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_B	6	1	Takeoff	MaxTakeoff	D_05				
737MAX8	ICAO_B	6	2	Climb	MaxTakeoff	D_05	1 000			
737MAX8	ICAO_B	6	3	Accelerate	MaxTakeoff	D_01		1 345	188	
737MAX8	ICAO_B	6	4	Accelerate	MaxTakeoff	D_00		1 634	220	
737MAX8	ICAO_B	6	5	Climb	MaxClimb	D_00	3 000			
737MAX8	ICAO_B	6	6	Accelerate	MaxClimb	D_00		1 262	250	
737MAX8	ICAO_B	6	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_B	6	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_B	6	9	Climb	MaxClimb	D_00	10 000			
737MAX8	ICAO_B	M	1	Takeoff	MaxTakeoff	D_05				

737MAX8	ICAO_B	M	2	Climb	MaxTakeoff	D_05	1 000			
737MAX8	ICAO_B	M	3	Accelerate	MaxTakeoff	D_01		1 287	191	
737MAX8	ICAO_B	M	4	Accelerate	MaxTakeoff	D_00		1 426	225	
737MAX8	ICAO_B	M	5	Climb	MaxClimb	D_00	3 000			
737MAX8	ICAO_B	M	6	Accelerate	MaxClimb	D_00		1 196	250	
737MAX8	ICAO_B	M	7	Climb	MaxClimb	D_00	5 500			
737MAX8	ICAO_B	M	8	Climb	MaxClimb	D_00	7 500			
737MAX8	ICAO_B	M	9	Climb	MaxClimb	D_00	10 000'			

(g) in Table I-4 (part 2), the following rows are added:

A350-941	DEFAULT	1	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	1	2	Climb	MaxTakeoff	D_1+F_D	1 000			
A350-941	DEFAULT	1	3	Accelerate	MaxTakeoff	D_1+F_U		1 726,5	170,7	60
A350-941	DEFAULT	1	4	Accelerate	MaxTakeoff	D_1_U		1 862,6	197,2	60
A350-941	DEFAULT	1	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	1	6	Accelerate	MaxClimb	D_ZERO		1 658	250	60
A350-941	DEFAULT	1	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	2	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	2	2	Climb	MaxTakeoff	D_1+F_D	1 000			
A350-941	DEFAULT	2	3	Accelerate	MaxTakeoff	D_1+F_U		1 699,9	173,1	60
A350-941	DEFAULT	2	4	Accelerate	MaxTakeoff	D_1_U		1 812,6	198,6	60
A350-941	DEFAULT	2	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	2	6	Accelerate	MaxClimb	D_ZERO		1 604,5	250	60
A350-941	DEFAULT	2	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	3	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	3	2	Climb	MaxTakeoff	D_1+F_D	1 000			
A350-941	DEFAULT	3	3	Accelerate	MaxTakeoff	D_1+F_U		1 662,2	175,6	60
A350-941	DEFAULT	3	4	Accelerate	MaxTakeoff	D_1_U		1 762,3	200,1	60

A350-941	DEFAULT	3	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	3	6	Accelerate	MaxClimb	D_ZERO		1 551,6	250	60
A350-941	DEFAULT	3	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	4	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	4	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	DEFAULT	4	3	Accelerate	MaxTakeoff	D_1+F_U		1 586,1	179,9	60
A350-941	DEFAULT	4	4	Accelerate	MaxTakeoff	D_1_U		1 679,8	202,7	60
A350-941	DEFAULT	4	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	4	6	Accelerate	MaxClimb	D_ZERO		1 465,3	250	60
A350-941	DEFAULT	4	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	5	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	5	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	DEFAULT	5	3	Accelerate	MaxTakeoff	D_1+F_U		1 491,7	185,3	60
A350-941	DEFAULT	5	4	Accelerate	MaxTakeoff	D_1_U		1 586,9	206,4	60
A350-941	DEFAULT	5	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	5	6	Accelerate	MaxClimb	D_ZERO		1 365,5	250	60
A350-941	DEFAULT	5	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	6	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	6	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	DEFAULT	6	3	Accelerate	MaxTakeoff	D_1+F_U		1 399,5	191,1	60
A350-941	DEFAULT	6	4	Accelerate	MaxTakeoff	D_1_U		1 494,1	210,4	60
A350-941	DEFAULT	6	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	6	6	Accelerate	MaxClimb	D_ZERO		1 268,2	250	60
A350-941	DEFAULT	6	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	7	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	7	2	Climb	MaxTakeoff	D_1+F_U	1 000			

A350-941	DEFAULT	7	3	Accelerate	MaxTakeoff	D_1+F_U		1 314	197	60
A350-941	DEFAULT	7	4	Accelerate	MaxTakeoff	D_1_U		1 407,1	214,7	60
A350-941	DEFAULT	7	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	7	6	Accelerate	MaxClimb	D_ZERO		1 176,3	250	60
A350-941	DEFAULT	7	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	8	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	8	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	DEFAULT	8	3	Accelerate	MaxTakeoff	D_1+F_U		1 233,3	203,4	60
A350-941	DEFAULT	8	4	Accelerate	MaxTakeoff	D_1_U		1 325,3	219,6	60
A350-941	DEFAULT	8	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	8	6	Accelerate	MaxClimb	D_ZERO		1 089,2	250	60
A350-941	DEFAULT	8	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	M	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	M	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	DEFAULT	M	3	Accelerate	MaxTakeoff	D_1+F_U		1 185,1	207,6	60
A350-941	DEFAULT	M	4	Accelerate	MaxTakeoff	D_1_U		1 275,6	222,9	60
A350-941	DEFAULT	M	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	M	6	Accelerate	MaxClimb	D_ZERO		1 036,7	250	60
A350-941	DEFAULT	M	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	1	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	1	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	1	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	1	4	Accelerate	MaxClimb	D_1+F_U		1 323,2	171	60
A350-941	ICAO_A	1	5	Accelerate	MaxClimb	D_1_U		1 353,1	189,5	60
A350-941	ICAO_A	1	6	Accelerate	MaxClimb	D_ZERO		1 514,1	213,7	60
A350-941	ICAO_A	1	7	Accelerate	MaxClimb	D_ZERO		1 673,8	250	60

A350-941	ICAO_A	1	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	2	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	2	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	2	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	2	4	Accelerate	MaxClimb	D_1+F_U		1 265,7	173,4	60
A350-941	ICAO_A	2	5	Accelerate	MaxClimb	D_1_U		1 315,1	191,2	60
A350-941	ICAO_A	2	6	Accelerate	MaxClimb	D_ZERO		1 466,2	214,5	60
A350-941	ICAO_A	2	7	Accelerate	MaxClimb	D_ZERO		1 619,3	250	60
A350-941	ICAO_A	2	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	3	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	3	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	3	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	3	4	Accelerate	MaxClimb	D_1+F_U		1 214,3	175,9	60
A350-941	ICAO_A	3	5	Accelerate	MaxClimb	D_1_U		1 276,7	193	60
A350-941	ICAO_A	3	6	Accelerate	MaxClimb	D_ZERO		1 418,4	215,4	60
A350-941	ICAO_A	3	7	Accelerate	MaxClimb	D_ZERO		1 565	250	60
A350-941	ICAO_A	3	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	4	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	4	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	4	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	4	4	Accelerate	MaxClimb	D_1+F_U		1 138,4	180,3	60
A350-941	ICAO_A	4	5	Accelerate	MaxClimb	D_1_U		1 212,8	196,1	60
A350-941	ICAO_A	4	6	Accelerate	MaxClimb	D_ZERO		1 340,5	217	60
A350-941	ICAO_A	4	7	Accelerate	MaxClimb	D_ZERO		1 476,4	250	60
A350-941	ICAO_A	4	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	5	1	Takeoff	MaxTakeoff	D_1+F_D				

A350-941	ICAO_A	5	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	5	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	5	4	Accelerate	MaxClimb	D_1+F_U		1 066,3	185,8	60
A350-941	ICAO_A	5	5	Accelerate	MaxClimb	D_1_U		1 139,9	200,3	60
A350-941	ICAO_A	5	6	Accelerate	MaxClimb	D_ZERO		1 252,3	219,5	60
A350-941	ICAO_A	5	7	Accelerate	MaxClimb	D_ZERO		1 374,5	250	60
A350-941	ICAO_A	5	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	6	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	6	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	6	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	6	4	Accelerate	MaxClimb	D_1+F_U		994,4	191,7	60
A350-941	ICAO_A	6	5	Accelerate	MaxClimb	D_1_U		1 064,9	204,8	60
A350-941	ICAO_A	6	6	Accelerate	MaxClimb	D_ZERO		1 165,9	222,3	60
A350-941	ICAO_A	6	7	Accelerate	MaxClimb	D_ZERO		1 275,1	250	60
A350-941	ICAO_A	6	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	7	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	7	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	7	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	7	4	Accelerate	MaxClimb	D_1+F_U		927	197,8	60
A350-941	ICAO_A	7	5	Accelerate	MaxClimb	D_1_U		994,4	209,7	60
A350-941	ICAO_A	7	6	Accelerate	MaxClimb	D_ZERO		1 085,3	225,7	60
A350-941	ICAO_A	7	7	Accelerate	MaxClimb	D_ZERO		1 181	250	60
A350-941	ICAO_A	7	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	8	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	8	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	8	3	Climb	MaxClimb	D_1+F_U	3 000			

A350-941	ICAO_A	8	4	Accelerate	MaxClimb	D_1+F_U		862,4	204,1	60
A350-941	ICAO_A	8	5	Accelerate	MaxClimb	D_1_U		927,4	214,9	60
A350-941	ICAO_A	8	6	Accelerate	MaxClimb	D_ZERO		1 009,2	229,4	60
A350-941	ICAO_A	8	7	Accelerate	MaxClimb	D_ZERO		1 091,2	250	60
A350-941	ICAO_A	8	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	M	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	M	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	M	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	M	4	Accelerate	MaxClimb	D_1+F_U		823,3	208,3	60
A350-941	ICAO_A	M	5	Accelerate	MaxClimb	D_1_U		886,5	218,4	60
A350-941	ICAO_A	M	6	Accelerate	MaxClimb	D_ZERO		963,5	232	60
A350-941	ICAO_A	M	7	Accelerate	MaxClimb	D_ZERO		1 036,9	250	60
A350-941	ICAO_A	M	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	1	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	1	2	Climb	MaxTakeoff	D_1+F_D	1 000			
A350-941	ICAO_B	1	3	Accelerate	MaxTakeoff	D_1+F_U		1 726,5	170,7	60
A350-941	ICAO_B	1	4	Accelerate	MaxTakeoff	D_1_U		1 862,6	197,2	60
A350-941	ICAO_B	1	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	1	6	Accelerate	MaxClimb	D_ZERO		1 658	250	60
A350-941	ICAO_B	1	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	2	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	2	2	Climb	MaxTakeoff	D_1+F_D	1 000			
A350-941	ICAO_B	2	3	Accelerate	MaxTakeoff	D_1+F_U		1 699,9	173,1	60
A350-941	ICAO_B	2	4	Accelerate	MaxTakeoff	D_1_U		1 812,6	198,6	60
A350-941	ICAO_B	2	5	Climb	MaxClimb	D_ZERO	3 000			

A350-941	ICAO_B	2	6	Accelerate	MaxClimb	D_ZERO		1 604,5	250	60
A350-941	ICAO_B	2	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	3	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	3	2	Climb	MaxTakeoff	D_1+F_D	1 000			
A350-941	ICAO_B	3	3	Accelerate	MaxTakeoff	D_1+F_U		1 662,2	175,6	60
A350-941	ICAO_B	3	4	Accelerate	MaxTakeoff	D_1_U		1 762,3	200,1	60
A350-941	ICAO_B	3	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	3	6	Accelerate	MaxClimb	D_ZERO		1 551,6	250	60
A350-941	ICAO_B	3	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	4	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	4	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	ICAO_B	4	3	Accelerate	MaxTakeoff	D_1+F_U		1 586,1	179,9	60
A350-941	ICAO_B	4	4	Accelerate	MaxTakeoff	D_1_U		1 679,8	202,7	60
A350-941	ICAO_B	4	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	4	6	Accelerate	MaxClimb	D_ZERO		1 465,3	250	60
A350-941	ICAO_B	4	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	5	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	5	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	ICAO_B	5	3	Accelerate	MaxTakeoff	D_1+F_U		1 491,7	185,3	60
A350-941	ICAO_B	5	4	Accelerate	MaxTakeoff	D_1_U		1 586,9	206,4	60
A350-941	ICAO_B	5	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	5	6	Accelerate	MaxClimb	D_ZERO		1 365,5	250	60
A350-941	ICAO_B	5	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	6	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	6	2	Climb	MaxTakeoff	D_1+F_U	1 000			

A350-941	ICAO_B	6	3	Accelerate	MaxTakeoff	D_1+F_U		1 399,5	191,1	60
A350-941	ICAO_B	6	4	Accelerate	MaxTakeoff	D_1_U		1 494,1	210,4	60
A350-941	ICAO_B	6	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	6	6	Accelerate	MaxClimb	D_ZERO		1 268,2	250	60
A350-941	ICAO_B	6	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	7	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	7	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	ICAO_B	7	3	Accelerate	MaxTakeoff	D_1+F_U		1 314	197	60
A350-941	ICAO_B	7	4	Accelerate	MaxTakeoff	D_1_U		1 407,1	214,7	60
A350-941	ICAO_B	7	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	7	6	Accelerate	MaxClimb	D_ZERO		1 176,3	250	60
A350-941	ICAO_B	7	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	8	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	8	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	ICAO_B	8	3	Accelerate	MaxTakeoff	D_1+F_U		1 233,3	203,4	60
A350-941	ICAO_B	8	4	Accelerate	MaxTakeoff	D_1_U		1 325,3	219,6	60
A350-941	ICAO_B	8	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	8	6	Accelerate	MaxClimb	D_ZERO		1 089,2	250	60
A350-941	ICAO_B	8	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	M	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	M	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	ICAO_B	M	3	Accelerate	MaxTakeoff	D_1+F_U		1 185,1	207,6	60
A350-941	ICAO_B	M	4	Accelerate	MaxTakeoff	D_1_U		1 275,6	222,9	60
A350-941	ICAO_B	M	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	M	6	Accelerate	MaxClimb	D_ZERO		1 036,7	250	60
A350-941	ICAO_B	M	7	Climb	MaxClimb	D_ZERO	10 000'			

(h) in Table I-4 (part 3), the following rows are added:

A350-941	DEFAULT	1	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	1	2	Climb	MaxTakeoff	D_1+F_D	1 000			
A350-941	DEFAULT	1	3	Accelerate	MaxTakeoff	D_1+F_U		1 726,5	170,7	60
A350-941	DEFAULT	1	4	Accelerate	MaxTakeoff	D_1_U		1 862,6	197,2	60
A350-941	DEFAULT	1	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	1	6	Accelerate	MaxClimb	D_ZERO		1 658	250	60
A350-941	DEFAULT	1	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	2	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	2	2	Climb	MaxTakeoff	D_1+F_D	1 000			
A350-941	DEFAULT	2	3	Accelerate	MaxTakeoff	D_1+F_U		1 699,9	173,1	60
A350-941	DEFAULT	2	4	Accelerate	MaxTakeoff	D_1_U		1 812,6	198,6	60
A350-941	DEFAULT	2	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	2	6	Accelerate	MaxClimb	D_ZERO		1 604,5	250	60
A350-941	DEFAULT	2	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	3	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	3	2	Climb	MaxTakeoff	D_1+F_D	1 000			
A350-941	DEFAULT	3	3	Accelerate	MaxTakeoff	D_1+F_U		1 662,2	175,6	60
A350-941	DEFAULT	3	4	Accelerate	MaxTakeoff	D_1_U		1 762,3	200,1	60
A350-941	DEFAULT	3	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	3	6	Accelerate	MaxClimb	D_ZERO		1 551,6	250	60
A350-941	DEFAULT	3	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	4	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	4	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	DEFAULT	4	3	Accelerate	MaxTakeoff	D_1+F_U		1 586,1	179,9	60

A350-941	DEFAULT	4	4	Accelerate	MaxTakeoff	D_1_U		1 679,8	202,7	60
A350-941	DEFAULT	4	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	4	6	Accelerate	MaxClimb	D_ZERO		1 465,3	250	60
A350-941	DEFAULT	4	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	5	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	5	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	DEFAULT	5	3	Accelerate	MaxTakeoff	D_1+F_U		1 491,7	185,3	60
A350-941	DEFAULT	5	4	Accelerate	MaxTakeoff	D_1_U		1 586,9	206,4	60
A350-941	DEFAULT	5	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	5	6	Accelerate	MaxClimb	D_ZERO		1 365,5	250	60
A350-941	DEFAULT	5	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	6	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	6	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	DEFAULT	6	3	Accelerate	MaxTakeoff	D_1+F_U		1 399,5	191,1	60
A350-941	DEFAULT	6	4	Accelerate	MaxTakeoff	D_1_U		1 494,1	210,4	60
A350-941	DEFAULT	6	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	6	6	Accelerate	MaxClimb	D_ZERO		1 268,2	250	60
A350-941	DEFAULT	6	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	7	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	7	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	DEFAULT	7	3	Accelerate	MaxTakeoff	D_1+F_U		1 314	197	60
A350-941	DEFAULT	7	4	Accelerate	MaxTakeoff	D_1_U		1 407,1	214,7	60
A350-941	DEFAULT	7	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	7	6	Accelerate	MaxClimb	D_ZERO		1 176,3	250	60
A350-941	DEFAULT	7	7	Climb	MaxClimb	D_ZERO	10 000			

A350-941	DEFAULT	8	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	8	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	DEFAULT	8	3	Accelerate	MaxTakeoff	D_1+F_U		1 233,3	203,4	60
A350-941	DEFAULT	8	4	Accelerate	MaxTakeoff	D_1_U		1 325,3	219,6	60
A350-941	DEFAULT	8	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	8	6	Accelerate	MaxClimb	D_ZERO		1 089,2	250	60
A350-941	DEFAULT	8	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	DEFAULT	M	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	DEFAULT	M	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	DEFAULT	M	3	Accelerate	MaxTakeoff	D_1+F_U		1 185,1	207,6	60
A350-941	DEFAULT	M	4	Accelerate	MaxTakeoff	D_1_U		1 275,6	222,9	60
A350-941	DEFAULT	M	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	DEFAULT	M	6	Accelerate	MaxClimb	D_ZERO		1 036,7	250	60
A350-941	DEFAULT	M	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	1	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	1	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	1	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	1	4	Accelerate	MaxClimb	D_1+F_U		1 323,2	171	60
A350-941	ICAO_A	1	5	Accelerate	MaxClimb	D_1_U		1 353,1	189,5	60
A350-941	ICAO_A	1	6	Accelerate	MaxClimb	D_ZERO		1 514,1	213,7	60
A350-941	ICAO_A	1	7	Accelerate	MaxClimb	D_ZERO		1 673,8	250	60
A350-941	ICAO_A	1	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	2	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	2	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	2	3	Climb	MaxClimb	D_1+F_U	3 000			

A350-941	ICAO_A	2	4	Accelerate	MaxClimb	D_1+F_U		1 265,7	173,4	60
A350-941	ICAO_A	2	5	Accelerate	MaxClimb	D_1_U		1 315,1	191,2	60
A350-941	ICAO_A	2	6	Accelerate	MaxClimb	D_ZERO		1 466,2	214,5	60
A350-941	ICAO_A	2	7	Accelerate	MaxClimb	D_ZERO		1 619,3	250	60
A350-941	ICAO_A	2	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	3	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	3	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	3	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	3	4	Accelerate	MaxClimb	D_1+F_U		1 214,3	175,9	60
A350-941	ICAO_A	3	5	Accelerate	MaxClimb	D_1_U		1 276,7	193	60
A350-941	ICAO_A	3	6	Accelerate	MaxClimb	D_ZERO		1 418,4	215,4	60
A350-941	ICAO_A	3	7	Accelerate	MaxClimb	D_ZERO		1 565	250	60
A350-941	ICAO_A	3	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	4	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	4	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	4	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	4	4	Accelerate	MaxClimb	D_1+F_U		1 138,4	180,3	60
A350-941	ICAO_A	4	5	Accelerate	MaxClimb	D_1_U		1 212,8	196,1	60
A350-941	ICAO_A	4	6	Accelerate	MaxClimb	D_ZERO		1 340,5	217	60
A350-941	ICAO_A	4	7	Accelerate	MaxClimb	D_ZERO		1 476,4	250	60
A350-941	ICAO_A	4	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	5	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	5	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	5	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	5	4	Accelerate	MaxClimb	D_1+F_U		1 066,3	185,8	60

A350-941	ICAO_A	5	5	Accelerate	MaxClimb	D_1_U		1 139,9	200,3	60
A350-941	ICAO_A	5	6	Accelerate	MaxClimb	D_ZERO		1 252,3	219,5	60
A350-941	ICAO_A	5	7	Accelerate	MaxClimb	D_ZERO		1 374,5	250	60
A350-941	ICAO_A	5	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	6	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	6	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	6	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	6	4	Accelerate	MaxClimb	D_1+F_U		994,4	191,7	60
A350-941	ICAO_A	6	5	Accelerate	MaxClimb	D_1_U		1 064,9	204,8	60
A350-941	ICAO_A	6	6	Accelerate	MaxClimb	D_ZERO		1 165,9	222,3	60
A350-941	ICAO_A	6	7	Accelerate	MaxClimb	D_ZERO		1 275,1	250	60
A350-941	ICAO_A	6	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	7	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	7	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	7	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	7	4	Accelerate	MaxClimb	D_1+F_U		927	197,8	60
A350-941	ICAO_A	7	5	Accelerate	MaxClimb	D_1_U		994,4	209,7	60
A350-941	ICAO_A	7	6	Accelerate	MaxClimb	D_ZERO		1 085,3	225,7	60
A350-941	ICAO_A	7	7	Accelerate	MaxClimb	D_ZERO		1 181	250	60
A350-941	ICAO_A	7	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	8	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	8	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	8	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	8	4	Accelerate	MaxClimb	D_1+F_U		862,4	204,1	60
A350-941	ICAO_A	8	5	Accelerate	MaxClimb	D_1_U		927,4	214,9	60

A350-941	ICAO_A	8	6	Accelerate	MaxClimb	D_ZERO		1 009,2	229,4	60
A350-941	ICAO_A	8	7	Accelerate	MaxClimb	D_ZERO		1 091,2	250	60
A350-941	ICAO_A	8	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_A	M	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_A	M	2	Climb	MaxTakeoff	D_1+F_U	1 500			
A350-941	ICAO_A	M	3	Climb	MaxClimb	D_1+F_U	3 000			
A350-941	ICAO_A	M	4	Accelerate	MaxClimb	D_1+F_U		823,3	208,3	60
A350-941	ICAO_A	M	5	Accelerate	MaxClimb	D_1_U		886,5	218,4	60
A350-941	ICAO_A	M	6	Accelerate	MaxClimb	D_ZERO		963,5	232	60
A350-941	ICAO_A	M	7	Accelerate	MaxClimb	D_ZERO		1 036,9	250	60
A350-941	ICAO_A	M	8	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	1	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	1	2	Climb	MaxTakeoff	D_1+F_D	1 000			
A350-941	ICAO_B	1	3	Accelerate	MaxTakeoff	D_1+F_U		1 726,5	170,7	60
A350-941	ICAO_B	1	4	Accelerate	MaxTakeoff	D_1_U		1 862,6	197,2	60
A350-941	ICAO_B	1	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	1	6	Accelerate	MaxClimb	D_ZERO		1 658	250	60
A350-941	ICAO_B	1	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	2	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	2	2	Climb	MaxTakeoff	D_1+F_D	1 000			
A350-941	ICAO_B	2	3	Accelerate	MaxTakeoff	D_1+F_U		1 699,9	173,1	60
A350-941	ICAO_B	2	4	Accelerate	MaxTakeoff	D_1_U		1 812,6	198,6	60
A350-941	ICAO_B	2	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	2	6	Accelerate	MaxClimb	D_ZERO		1 604,5	250	60
A350-941	ICAO_B	2	7	Climb	MaxClimb	D_ZERO	10 000			

A350-941	ICAO_B	3	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	3	2	Climb	MaxTakeoff	D_1+F_D	1 000			
A350-941	ICAO_B	3	3	Accelerate	MaxTakeoff	D_1+F_U		1 662,2	175,6	60
A350-941	ICAO_B	3	4	Accelerate	MaxTakeoff	D_1_U		1 762,3	200,1	60
A350-941	ICAO_B	3	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	3	6	Accelerate	MaxClimb	D_ZERO		1 551,6	250	60
A350-941	ICAO_B	3	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	4	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	4	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	ICAO_B	4	3	Accelerate	MaxTakeoff	D_1+F_U		1 586,1	179,9	60
A350-941	ICAO_B	4	4	Accelerate	MaxTakeoff	D_1_U		1 679,8	202,7	60
A350-941	ICAO_B	4	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	4	6	Accelerate	MaxClimb	D_ZERO		1 465,3	250	60
A350-941	ICAO_B	4	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	5	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	5	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	ICAO_B	5	3	Accelerate	MaxTakeoff	D_1+F_U		1 491,7	185,3	60
A350-941	ICAO_B	5	4	Accelerate	MaxTakeoff	D_1_U		1 586,9	206,4	60
A350-941	ICAO_B	5	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	5	6	Accelerate	MaxClimb	D_ZERO		1 365,5	250	60
A350-941	ICAO_B	5	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	6	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	6	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	ICAO_B	6	3	Accelerate	MaxTakeoff	D_1+F_U		1 399,5	191,1	60
A350-941	ICAO_B	6	4	Accelerate	MaxTakeoff	D_1_U		1 494,1	210,4	60

A350-941	ICAO_B	6	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	6	6	Accelerate	MaxClimb	D_ZERO		1 268,2	250	60
A350-941	ICAO_B	6	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	7	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	7	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	ICAO_B	7	3	Accelerate	MaxTakeoff	D_1+F_U		1 314	197	60
A350-941	ICAO_B	7	4	Accelerate	MaxTakeoff	D_1_U		1 407,1	214,7	60
A350-941	ICAO_B	7	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	7	6	Accelerate	MaxClimb	D_ZERO		1 176,3	250	60
A350-941	ICAO_B	7	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	8	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	8	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	ICAO_B	8	3	Accelerate	MaxTakeoff	D_1+F_U		1 233,3	203,4	60
A350-941	ICAO_B	8	4	Accelerate	MaxTakeoff	D_1_U		1 325,3	219,6	60
A350-941	ICAO_B	8	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	8	6	Accelerate	MaxClimb	D_ZERO		1 089,2	250	60
A350-941	ICAO_B	8	7	Climb	MaxClimb	D_ZERO	10 000			
A350-941	ICAO_B	M	1	Takeoff	MaxTakeoff	D_1+F_D				
A350-941	ICAO_B	M	2	Climb	MaxTakeoff	D_1+F_U	1 000			
A350-941	ICAO_B	M	3	Accelerate	MaxTakeoff	D_1+F_U		1 185,1	207,6	60
A350-941	ICAO_B	M	4	Accelerate	MaxTakeoff	D_1_U		1 275,6	222,9	60
A350-941	ICAO_B	M	5	Climb	MaxClimb	D_ZERO	3 000			
A350-941	ICAO_B	M	6	Accelerate	MaxClimb	D_ZERO		1 036,7	250	60
A350-941	ICAO_B	M	7	Climb	MaxClimb	D_ZERO	10 000			
ATR72	DEFAULT	1	1	Takeoff	MaxTakeoff	15				

ATR72	DEFAULT	1	2	Climb	MaxTakeoff	15	1 000			
ATR72	DEFAULT	1	3	Accelerate	MaxClimb	INTR		885	133,3	39,1
ATR72	DEFAULT	1	4	Accelerate	MaxClimb	ZERO		1 040	142,4	35,6
ATR72	DEFAULT	1	5	Climb	MaxClimb	ZERO	3 000			
ATR72	DEFAULT	1	6	Accelerate	MaxClimb	ZERO		964	168,3	38,9
ATR72	DEFAULT	1	7	Climb	MaxClimb	ZERO	5 500			
ATR72	DEFAULT	1	8	Climb	MaxClimb	ZERO	7 500			
ATR72	DEFAULT	1	9	Climb	MaxClimb	ZERO	10 000			
ATR72	DEFAULT	2	1	Takeoff	MaxTakeoff	15				
ATR72	DEFAULT	2	2	Climb	MaxTakeoff	15	1 000			
ATR72	DEFAULT	2	3	Accelerate	MaxClimb	INTR		900	138	31,7
ATR72	DEFAULT	2	4	Accelerate	MaxClimb	ZERO		995	147,3	32,2
ATR72	DEFAULT	2	5	Climb	MaxClimb	ZERO	3 000			
ATR72	DEFAULT	2	6	Accelerate	MaxClimb	ZERO		962	168,3	32,1
ATR72	DEFAULT	2	7	Climb	MaxClimb	ZERO	5 500			
ATR72	DEFAULT	2	8	Climb	MaxClimb	ZERO	7 500			
ATR72	DEFAULT	2	9	Climb	MaxClimb	ZERO	10 000			
ATR72	DEFAULT	3	1	Takeoff	MaxTakeoff	15				
ATR72	DEFAULT	3	2	Climb	MaxTakeoff	15	1 000			
ATR72	DEFAULT	3	3	Accelerate	MaxClimb	INTR		890	139,8	24,5
ATR72	DEFAULT	3	4	Accelerate	MaxClimb	ZERO		942	149,2	27,9
ATR72	DEFAULT	3	5	Climb	MaxClimb	ZERO	3 000			
ATR72	DEFAULT	3	6	Accelerate	MaxClimb	ZERO		907	168,3	27,8
ATR72	DEFAULT	3	7	Climb	MaxClimb	ZERO	5 500			
ATR72	DEFAULT	3	8	Climb	MaxClimb	ZERO	7 500			
ATR72	DEFAULT	3	9	Climb	MaxClimb	ZERO	10 000'			

(i) in Table I-6, the following rows are added:

'7378MAX	1	140 000
7378MAX	2	144 600
7378MAX	3	149 600
7378MAX	4	159 300
7378MAX	5	171 300
7378MAX	6	174 500
7378MAX	M	181 200
A350-941	1	421 680
A350-941	2	433 189
A350-941	3	445 270
A350-941	4	466 326
A350-941	5	493 412
A350-941	6	522 377
A350-941	7	552 871
A350-941	8	585 147
A350-941	M	606 271
ATR72	1	44 750
ATR72	2	47 620
ATR72	3	50 710'

(j) in Table I-7, after the row

'737800	MaxTkoffHiTemp	30 143,2	-29,773	-0,029	0	-145,2'				
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the following rows are added:

'737800	IdleApproach	649,0	-3,3	0,0118	0	0				
7378MAX	IdleApproach	1 046	-4,6	0,0147	0	0				
7378MAX	MaxClimb	21 736	-28,6	0,3333	-3,28E-06	0				
7378MAX	MaxClimbHiTemp	23 323	-15,1	-0,09821	6,40E-06	-142,0575				
7378MAX	MaxTakeoff	26 375	-32,3	0,07827	8,81E-07	0				
7378MAX	MaxTkoffHiTemp	30 839	-27,1	-0,06346	-8,23E-06	-183,1101				
A350-941	IdleApproach	5 473,2	-24,305716	0,0631198	-4,21E-06	0				
A350-941	IdleApproachHi-Temp	5 473,2	-24,305716	0,0631198	-4,21E-06	0				
A350-941	MaxClimb	67 210,9	-82,703367	1,18939	-0,000012074	0				

A350-941	MaxClimbHiTemp	76 854,6	-75,672429	0	0	-466				
A350-941	MaxTakeoff	84 912,8	-101,986997	0,940876	-8,31E-06	0				
A350-941	MaxTkoffHiTemp	96 170,0	-101,339623	0	0	-394				
ATR72	MaxClimb	5 635,2	-9,5	0,01127	0,00000027	0				
ATR72	MaxTakeoff	7 583,5	-20,3	0,137399	-0,00000604	0'				

(k) in Table I-9, the following rows are added:

7378MAX	LAmax	A	3 000	90,4	83,4	78,7	73,8	65,9	57,1	50,7	43,6	36,5	29,7
7378MAX	LAmax	A	4 000	90,5	83,4	78,8	73,8	65,9	57,1	50,6	43,5	36,4	29,6
7378MAX	LAmax	A	5 000	90,7	83,7	79	74,1	66,1	57,2	50,7	43,6	36,5	29,6
7378MAX	LAmax	A	6 000	91	84	79,4	74,4	66,5	57,6	51	43,9	36,7	29,9
7378MAX	LAmax	A	7 000	91,5	84,4	79,8	74,8	66,9	58	51,5	44,3	37,1	30,2
7378MAX	LAmax	D	10 000	92,4	85,8	81,4	76,6	68,9	60,2	53,9	46,8	39,7	33
7378MAX	LAmax	D	13 000	94,2	87,7	83,2	78,4	70,7	62	55,6	48,5	41,4	34,6
7378MAX	LAmax	D	16 000	96	89,4	84,9	80,1	72,4	63,7	57,3	50,3	43,2	36,5
7378MAX	LAmax	D	19 000	97,6	91	86,5	81,8	74	65,3	59	52,1	45,1	38,4
7378MAX	LAmax	D	22 000	99,2	92,6	88,1	83,4	75,6	67	60,8	54	47,1	40,5
7378MAX	LAmax	D	24 500	100,6	94	89,5	84,8	77	68,5	62,4	55,7	48,9	42,5
7378MAX	SEL	A	3 000	92,6	88,4	85,6	82,4	77,2	70,9	66,1	60,8	55,4	50,2
7378MAX	SEL	A	4 000	92,7	88,6	85,8	82,6	77,3	71	66,2	60,9	55,5	50,4
7378MAX	SEL	A	5 000	93	88,9	86,1	82,9	77,6	71,3	66,5	61,1	55,7	50,6
7378MAX	SEL	A	6 000	93,3	89,3	86,4	83,2	77,9	71,6	66,8	61,4	56	50,8
7378MAX	SEL	A	7 000	93,7	89,6	86,8	83,6	78,3	72	67,1	61,8	56,3	51,1
7378MAX	SEL	D	10 000	94,3	90,4	87,6	84,5	79,1	72,9	68,3	63,2	58	53,1
7378MAX	SEL	D	13 000	96,1	92,2	89,4	86,3	80,8	74,5	69,9	64,8	59,6	54,8
7378MAX	SEL	D	16 000	97,6	93,7	90,9	87,8	82,5	76,3	71,7	66,7	61,6	56,9
7378MAX	SEL	D	19 000	98,8	95	92,3	89,3	84	78	73,6	68,7	63,8	59,1
7378MAX	SEL	D	22 000	100	96,2	93,6	90,6	85,6	79,8	75,5	70,8	66,1	61,7

7378MAX	SEL	D	24 500	100,9	97,2	94,6	91,7	86,9	81,4	77,4	72,8	68,3	64,1
A350-941	LAmax	A	1 000	91,21	84,42	79,83	74,97	67,15	58,68	52,65	46,06	38,92	31,73
A350-941	LAmax	A	10 000	92,16	85,43	80,83	75,99	68,31	59,92	53,97	47,34	40,08	32,68
A350-941	LAmax	A	17 000	94,76	87,92	83,18	78,16	70,23	61,75	55,72	49,06	41,55	33,91
A350-941	LAmax	D	25 000	92,83	85,22	80,6	75,75	68,22	60	54,03	47,27	39,73	31,65
A350-941	LAmax	D	35 000	95,16	88,13	83,33	78,27	70,38	61,9	55,87	49,15	41,66	33,82
A350-941	LAmax	D	50 000	99,67	92,61	87,75	82,5	74,45	66,01	60	53,34	45,7	37,42
A350-941	LAmax	D	70 000	103,74	96,78	91,98	86,87	78,8	70,01	63,7	56,71	48,8	40,63
A350-941	SEL	A	1 000	94,18	89,98	86,96	83,74	78,42	72,25	67,64	62,45	56,7	50,92
A350-941	SEL	A	10 000	95,52	91,32	88,29	85,06	79,78	73,75	69,24	64,17	58,36	52,34
A350-941	SEL	A	17 000	97,74	93,39	90,3	87,01	81,68	75,62	71,18	66,09	60,23	54
A350-941	SEL	D	25 000	95,67	90,95	87,67	84,23	78,73	72,73	68,33	63,24	57,19	50,52
A350-941	SEL	D	35 000	97,28	92,81	89,7	86,39	81,04	75,18	70,92	65,83	59,85	53,36
A350-941	SEL	D	50 000	100,98	96,76	93,79	90,43	85,11	79,2	74,81	69,77	63,84	57,37
A350-941	SEL	D	70 000	104,66	100,74	97,82	94,68	89,49	83,56	79,09	73,94	67,84	61,27
ATR72	LAmax	A	890	86,6	79,4	74,4	69,2	61,1	52,5	46,6	40	32,7	25
ATR72	LAmax	A	900	86,6	79,4	74,4	69,2	61,1	52,5	46,6	40	32,7	25
ATR72	LAmax	A	1 250	86,7	79,5	74,5	69,3	61,2	52,6	46,6	40	32,6	24,8
ATR72	LAmax	A	1 600	87,5	80,2	75,1	69,9	61,9	53,4	47,4	40,8	33,4	25,7
ATR72	LAmax	D	3 000	87,7	81,1	76,7	71,9	64,4	56,7	50,9	44,1	37,2	29,9
ATR72	LAmax	D	3 600	89,4	82,8	78,6	73,9	66,3	58	52,2	45,5	38,8	31,5
ATR72	LAmax	D	4 200	91,1	84,5	80,6	75,9	68,2	59,8	53,9	47,1	40,2	32,9
ATR72	LAmax	D	4 800	92,8	86,3	82,5	77,9	70,1	62,1	56	48,8	41,5	33,8
ATR72	LAmax	D	4 900	94,6	88,2	84	79,7	72,9	65,7	60,8	55,3	50	43,9
ATR72	LAmax	D	5 300	95,7	89,5	85,2	81	74,3	67,3	62,4	57	51,7	45,6
ATR72	LAmax	D	5 310	95,7	89,5	85,2	81	74,3	67,3	62,4	57	51,7	45,6
ATR72	SEL	A	890	89,7	85	81,7	78,2	72,8	66,9	62,6	57,7	52,1	45,9
ATR72	SEL	A	900	89,7	85	81,7	78,2	72,8	66,9	62,6	57,7	52,1	45,9
ATR72	SEL	A	1 250	89,4	84,7	81,5	78,1	72,8	66,8	62,5	57,6	51,8	45,6
ATR72	SEL	A	1 600	89,7	85,1	81,8	78,4	73,1	67,3	63	58,1	52,4	46,2
ATR72	SEL	D	3 000	88,9	84,8	82	79	74,3	68,9	64,9	60	54,6	48,6
ATR72	SEL	D	3 600	90	85,9	83,2	80,3	75,5	70,3	66,4	61,6	56,4	50,5
ATR72	SEL	D	4 200	91,1	87,1	84,4	81,6	77	71,9	67,9	63	57,8	51,9
ATR72	SEL	D	4 800	92,2	88,2	85,6	82,9	78,8	73,8	69,6	64,4	58,8	52,7
ATR72	SEL	D	4 900	92,9	89,4	86,9	84,3	80,3	75,9	72,9	69,3	65,5	61,3
ATR72	SEL	D	5 300	93,7	90,2	87,7	85,2	81,4	77,1	74,1	70,6	66,8	62,6
ATR72	SEL	D	5 310	93,7	90,2	87,7	85,2	81,4	77,1	74,1	70,6	66,8	62,6'

(l) in Table I-10, the following rows are inserted after the row corresponding to 'Spectral Class ID' number 138:

'139	Departure	2-Engine. HighByPass.Tfan	71,4	67,4	59,1	69,3	75,3	76,7	72,6	69,3	76,4	71,2	71,8
140	Departure	2-Engine.Tprop	63,5	62,8	71,0	87,4	78,5	76,8	74,6	77,4	79,8	74,3	75,4'

(m) in Table I-10, the following rows are added:

'239	Approach	2-Engine. HighByPass.Tfan	71,0	65,0	60,7	70,7	74,8	76,5	73,2	71,8	75,9	73,0	71,1
240	Approach	2-Engine.Tprop	65,9	68,0	66,9	80,0	77,1	78,5	73,9	75,6	77,7	73,6	73,3'

DECISIONS

COMMISSION IMPLEMENTING DECISION (EU) 2021/1227

of 27 July 2021

amending the recognition of DNV GL AS in accordance with Article 16 of Regulation (EC) No 391/2009 of the European Parliament and of the Council

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EC) No 391/2009 of the European Parliament and of the Council of 23 April 2009 on the common rules and standards for ship inspection and survey organisations ⁽¹⁾, and in particular Article 4(1) and Article 16 thereof,

Whereas:

- (1) Pursuant to Regulation (EC) No 391/2009, the Commission is responsible for granting recognition to ship inspection and survey organisations wishing to be authorised to provide services on behalf of the Member States. Pursuant to Article 8(1) of that Regulation the Commission is also required to regularly assess recognised organisations to ensure that they continue to meet the requirements of that Regulation.
- (2) As part of that assessment, the Commission verifies that the holder of the recognition granted is the relevant legal entity within the organisation to which the provisions of Regulation (EC) No 391/2009 apply, within the meaning of and in accordance with Article 2, point (c) and Article 4(3) of that Regulation. Where that is not the case, the Commission should take a decision amending that recognition. Pursuant to Article 2, point (c) of Regulation (EC) No 391/2009, 'organisation' means a legal entity, its subsidiaries and any other entities under its control, which jointly or separately carry out tasks falling under the scope of that Regulation.
- (3) Commission Implementing Decision C(2013) 8876 established that the holder of the recognition granted to Det Norske Veritas was DNV GL AS. According to that Implementing Decision, DNV GL AS is the parent entity of all legal entities that constitute the recognised organisation for the purpose of Regulation (EC) No 391/2009.
- (4) The Commission was informed that as of 1 March 2021, the name of the parent legal entity of DNV GL AS has changed into DNV AS. As a result, the relevant parent legal entity to which recognition should be granted is DNV AS.
- (5) The change in the identity of the above-mentioned relevant parent entity does not impact the capability of this organisation to comply with the requirements set forth in Regulation (EC) 391/2009.
- (6) The measures provided for in this Decision are in accordance with the opinion of the Committee on Safe Seas and the Prevention of Pollution from Ships established by Regulation (EC) No 2099/2002 of the European Parliament and of the Council ⁽²⁾.

⁽¹⁾ OJ L 131, 28.5.2009, p. 11.

⁽²⁾ Regulation (EC) No 2099/2002 of the European Parliament and of the Council of 5 November 2002 establishing a Committee on Safe Seas and the Prevention of Pollution from Ships (COSS) and amending the Regulation on maritime safety and prevention of pollution from ships (OJ L 324, 29.11.2002, p.1).

HAS ADOPTED THIS DECISION:

Article 1

The recognition granted to DNV GL AS is amended by replacing the name of DNV GL AS with DNV AS, which is the parent entity of all legal entities that constitute the recognised organisation for the purpose of Regulation (EC) No 391/2009.

Article 2

This Decision shall enter into force on the day following that of its publication in the *Official Journal of the European Union*.

Done at Brussels, 27 July 2021.

For the Commission
The President
Ursula VON DER LEYEN

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