

COMMISSION IMPLEMENTING DECISION (EU) 2022/2324**of 23 November 2022****amending Decision 2008/294/EC, to include additional access technologies and measures for the operation of mobile communications services on aircraft (MCA services) in the Union***(notified under document C(2022) 8321)***(Text with EEA relevance)**

THE EUROPEAN COMMISSION,

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

Having regard to Decision No 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision) ⁽¹⁾, and in particular Article 4(3) thereof,

Whereas:

- (1) Commission Decision 2008/294/EC ⁽²⁾ allows the operation of mobile communication services on board aircraft (MCA services) in the European Union with GSM, UMTS and LTE technologies and sets out the applicable harmonised technical conditions for MCA services.
- (2) Adding 5G connectivity on aircraft enhances communications services for passengers during travel, whilst making use of the latest available technology and ensuring efficient spectrum use. This contributes to the achievement of the objectives set out in the Commission's strategy on connectivity as set out by the Commission's Communication 'Connectivity for a Competitive Digital Single Market – towards a European Gigabit Society' ⁽³⁾ and updated with the Commission Communication '2030 Digital Compass: the European way for the Digital Decade' ⁽⁴⁾.
- (3) Furthermore, the current regulatory framework requires the operation of a network control unit (NCU) as part of MCA equipment on board aircraft to prevent mobile terminals on board from attempting to register with UMTS terrestrial mobile communications networks.
- (4) On 14 October 2020, the European Commission gave a mandate to the European Conference of Postal and Telecommunications Administrations (CEPT), pursuant to Article 4(2) of Decision No 676/2002/EC, to undertake technical studies on the potential use of 5G technology and on making use of the network control unit optional on board MCA-enabled aircraft.
- (5) In response to that mandate, on 5 November 2021 the CEPT adopted its Report 81, which provides for harmonised technical conditions to operate 5G non-active antenna system (non-AAS) connectivity for MCA in the 1800 MHz (1710-1785 MHz and 1805-1880 MHz) frequency band and sets out conditions for the usage of a network control unit in MCA.
- (6) CEPT Report 81 concluded that the usage of NCU in MCA operations in the downlink portion of the 900 MHz band (925-960 MHz) to prevent connection to ground-based 3G UMTS networks should currently remain mandatory. It further concluded that the usage of NCU in MCA operations in the 3G downlink portion of the paired terrestrial 2 GHz band (2110-2170 MHz) could be made optional in the near future. As a result of new technical developments, it was no longer necessary to prevent through an NCU the connection of mobile terminals to terrestrial mobile networks operating in the UMTS 1800 MHz frequency band.

⁽¹⁾ OJ L 108, 24.4.2002, p. 1.

⁽²⁾ Commission Decision 2008/294/EC of 7 April 2008 on harmonised conditions of spectrum use for the operation of mobile communication services on aircraft (MCA services) in the Community (OJ L 98, 10.4.2008, p. 19).

⁽³⁾ COM(2016) 587.

⁽⁴⁾ COM(2021) 118.

- (7) CEPT Report 81 did not report any interference (e.g., increased signalling load, capacity degradation) suffered by mobile network operators on their terrestrial UMTS networks using the 900 MHz or the paired terrestrial 2 GHz frequency bands from mobile terminals on board aircraft (regardless of whether an aircraft is equipped with an MCA system including an NCU or not). According to Report 81, such absence of reporting was attributed particularly to the complexity of the impact and of the measurement of that impact.
- (8) The difficulty of assessing interference from mobile phones on board MCA-equipped aircraft to 3G UMTS ground networks and the related lack of evidence in CEPT Report 81 as regards the necessity of NCU deployment for 3G UMTS should be duly considered. However, subsequent to CEPT Report 81 the CEPT, taking into account further inputs and developments, has decided that the use of an NCU on board MCA-equipped aircraft in the 900 MHz and in the paired terrestrial 2 GHz bands should no longer be mandatory as of 1 January 2026, in line with the ongoing pace of upgrading networks to 4G and 5G and of phasing out 3G networks. ⁽³⁾
- (9) MCA technical specifications should remain under review to ensure that they continuously match technological progress and market developments.
- (10) Decision 2008/294/EC should therefore be amended accordingly.
- (11) The measures provided for in this Decision are in accordance with the opinion of the Radio Spectrum Committee,

HAS ADOPTED THIS DECISION:

Article 1

The Annex to Decision 2008/294/EC is replaced by the text in the Annex to this Decision.

Article 2

As early as possible, and in any case by 30 June 2023, the Member States shall make the frequency bands for 5G non-AAS indicated in Table 1 in the Annex available for MCA services on a non-interference and non-protected basis, provided such services meet the conditions set out in the Annex.

Article 3

This Decision is addressed to the Member States.

Done at Brussels, 23 November 2022.

For the Commission
Margrethe VESTAGER
Member of the Commission

⁽³⁾ With the amendment of ECC Decision (06)07 adopted on 1.7.2022, following a CEPT public consultation.

ANNEX

1. Frequency bands and systems allowed for MCA Services

Table 1

Type	Frequency	System
GSM 1 800	1 710-1 785 MHz (uplink) 1 805-1 880 MHz (downlink)	GSM complying with the GSM standards as published by ETSI, in particular EN 301 502, EN 301 511 and EN 302 480, or equivalent specifications.
UMTS 2 100 (FDD)	1 920-1 980 MHz (uplink) 2 110-2 170 MHz (downlink)	UMTS complying with the UMTS standards as published by ETSI, in particular EN 301 908-1, EN 301 908-2, EN 301 908-3 and EN 301 908-11, or equivalent specifications.
LTE 1 800 (FDD)	1 710-1 785 MHz (uplink) 1 805-1 880 MHz (downlink)	LTE complying with LTE standards, as published by ETSI, in particular EN 301 908-1, EN 301 908-13, EN 301 908-14, and EN 301 908-15, or equivalent specifications.
5G NR non-AAS	1 710-1 785 MHz (uplink) 1 805-1 880 MHz (downlink)	5G NR non-AAS complying with the 5G NR standards as published by ETSI, in particular EN 301 908-24 and EN 301 908-25, or equivalent specifications.

2. Prevention of connection of mobile terminals to ground networks

(a) Until 1 January 2026, mobile terminals receiving within the frequency bands and systems listed in Table 2 must be prevented from attempting to register with UMTS mobile networks on the ground:

- by the inclusion, in the MCA system, of a network control unit (NCU), which raises the noise floor inside the cabin in mobile receive bands, and/or
- by aircraft fuselage shielding to further attenuate the signal entering and leaving the fuselage.

Table 2

Frequency bands (MHz)	Systems on the ground
925-960 MHz	UMTS
2 110-2 170 MHz	UMTS

After this date, MCA operators may decide to continue implementing an NCU in the frequency bands and systems listed in Table 2.

(b) In addition to the provisions in paragraph a), MCA operators may decide to implement an NCU for terrestrial systems providing electronic communications services in the frequency bands listed in Table 3.

Table 3

Frequency bands (MHz)
460-470 MHz
791-821 MHz
925-960 MHz

1 805-1 880 MHz
2 110-2 170 MHz
2 620-2 690 MHz
2 570-2 620 MHz

3. Technical parameters

(a) Equivalent isotropic radiated power (EIRP) limits, outside the aircraft, resulting from the NCU/aircraft Base Station (BS)

Table 4

Height above ground (m)	Maximum EIRP outside the aircraft in dBm/(channel bandwidth)			
	NCU ⁽¹⁾	Aircraft GSM and LTE BS	Aircraft 5G NR non-AAS BS	Aircraft UMTS BS and NCU
	Band: 900 MHz	Band: 1 800 MHz	Band: 1 800MHz	Band: 2 100 MHz
	Channel Bandwidth = 3,84 MHz	Channel Bandwidth = 200 kHz ⁽²⁾	Channel Bandwidth = 5 MHz ⁽³⁾	Channel Bandwidth = 3,84 MHz
3 000	- 6,2	- 13,0	10	1,0
4 000	- 3,7	- 10,5	13	3,5
5 000	- 1,7	- 8,5	15	5,4
6 000	- 0,1	- 6,9	16	7,0
7 000	1,2	- 5,6	18	8,3
8 000	2,3	- 4,4	19	9,5

⁽¹⁾ The aircraft BS is not in operation at 900 MHz, however, an NCU is needed to prevent terminals using other MCA channels from connecting to the 900 MHz UMTS terrestrial networks.

⁽²⁾ For channel bandwidth other than 200 kHz, a correction, calculated by the formula $10 \times \log_{10} (\text{channel bandwidth}/(200 \text{ kHz}))$ dB, shall be added to the EIRP values.

⁽³⁾ For channel bandwidth other than 5 MHz, a correction, calculated by the formula $10 \times \log_{10} (\text{channel bandwidth}/(5 \text{ MHz}))$ dB, shall be added to the EIRP values.

(b) EIRP limits outside the aircraft, resulting from the mobile terminal operating on board

Table 5

Height above ground	Maximum EIRP, outside the aircraft, from the GSM mobile terminal in dBm/200 kHz	Maximum EIRP, outside the aircraft, from the LTE mobile terminal in dBm/5 MHz ⁽¹⁾	Maximum EIRP, outside the aircraft, from the LTE and 5G NR mobile terminal in dBm/5 MHz ⁽²⁾ ⁽³⁾ ⁽⁴⁾	Maximum EIRP, outside the aircraft, from the UMTS mobile terminal in dBm/3,84 MHz
(m)	GSM 1 800 MHz	LTE 1 800 MHz	LTE and 5G NR 1 800 MHz	UMTS 2 100 MHz
3 000	- 3,3	1,7	0	3,1
4 000	- 1,1	3,9	2	5,6
5 000	0,5	5	4	7
6 000	1,8	5	6	7
7 000	2,9	5	7	7

8 000	3,8	5	8	7
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(¹) These conditions apply to the operation of MCA systems installed until 31 December 2022.

(²) These conditions apply to the operation of MCA systems installed after 31 December 2022.

(³) For channel bandwidth other than 5 MHz, a correction, calculated by the formula $10 \times \log_{10}(\text{channel bandwidth}/5 \text{ MHz})$ dB, shall be added to the EIRP values.

(⁴) The EIRP is specified per channel regardless of the used channel bandwidth due to the fact that multiple mobile terminals could be operated.

(c) EIRP limits outside the aircraft, resulting from the NCU, in other relevant frequency bands

When MCA operators decide to use an NCU to prevent mobile terminals from attempting to register with non UMTS mobile networks on the ground in the frequency bands listed in Table 3, the maximum values indicated in Table 6 apply for the total EIRP outside the aircraft, resulting from the NCU, in conjunction with the values mentioned in Table 4.

Table 6

Height above ground (m)	Maximum EIRP outside the aircraft, resulting from the NCU			
	460-470 MHz	791-821 MHz	1 805-1 880 MHz	2 570-2 690 MHz
	dBm/1,25 MHz	dBm/10 MHz	dBm/200 kHz	dBm/4,75 MHz
3 000	- 17,0	- 0,87	- 13,0	1,9
4 000	- 14,5	1,63	- 10,5	4,4
5 000	- 12,6	3,57	- 8,5	6,3
6 000	- 11,0	5,15	- 6,9	7,9
7 000	- 9,6	6,49	- 5,6	9,3
8 000	- 8,5	7,65	- 4,4	10,4

(d) Operational requirements

- (1) The minimum height above ground for any transmission from an MCA system in operation must be 3 000 metres.
- (2) The aircraft Base Station, while in operation, must limit the transmit power of all GSM mobile terminals transmitting in the 1 800 MHz band to a nominal value of 0 dBm/200 kHz at all stages of communication, including initial access.
- (3) The aircraft Base Station, while in operation, must limit the transmit power of all LTE mobile terminals transmitting in the 1 800 MHz band to a nominal value of 5 dBm/5 MHz at all stages of communication.
- (4) The aircraft Base Station, while in operation, must limit the transmit power of all UMTS mobile terminals transmitting in the 2 100 MHz band to a nominal value of -6 dBm/3,84 MHz at all stages of communication and the maximum number of users should not exceed 20.
- (5) The aircraft Base Station, during operation, must limit the transmit power of all 5G NR mobile terminals transmitting in the 1 800 MHz band to a nominal value of 5 dBm/channel at all stages of communication, including initial access.