



ECC Decision (05)11

The free circulation and use of Aircraft Earth Stations (AES) in the frequency bands 14.0-14.5 GHz (Earth-to-space), 10.7-11.7 GHz (space-to-Earth) and 12.5-12.75 GHz (space-to-Earth)

Approved 24 June 2005

Amended: 8 March 2019

EXPLANATORY MEMORANDUM

1 INTRODUCTION

Aircraft Earth Stations (AES) are mobile earth stations in the aeronautical mobile-satellite service located on board aircraft and operate in the secondary MSS frequency allocations at 14 GHz. These AES will be authorised for the installation and for their operations by the national regulatory authority and/or civil aviation authority in the country where the aircraft are registered. The AES will operate within the airspace of many countries, however it is highly desirable that these administrations do not require additional authorisation for operation of each AES.

The purpose of this Decision is to designate the frequency band 14.0-14.5 GHz (Earth-to-space), 10.7-11.7 GHz and 12.5-12.75 GHz (space-to-Earth) for the use by AES and enable operation within CEPT countries of AES that have been authorised by their country of registration.

2 BACKGROUND

It is a general aim of the Electronic Communications Committee (ECC) to facilitate the free circulation and use of radio equipment.

The equipment under consideration in this decision, i.e. Aircraft Earth Stations (AES) installed on board aircraft, is intended to provide non-safety related broad-band data communication services (e.g. internet and other type of data services) to users on board aircraft using their own data equipment (e.g. laptop computer or PDA) or one provided by the airline. Operation of these stations without the need for individual authorisation by each of the CEPT administrations is essential for the provision of an uninterrupted service to users whilst aircraft using such equipment crosses borders of various countries, as well as in reducing the regulatory efforts for the administrations and the AMSS operators.

The AES have the following characteristics:

- a) They operate in the 14 GHz frequency band allocated to the mobile satellite service (MSS) on a secondary basis (WRC-03), and in the fixed satellite service (FSS) allocations at 10/11/12 GHz, where they operate on a non-protection basis:
 - 14.00-14.50 GHz (Earth-to-space);
 - 10.70-11.70 GHz (space-to-Earth);
 - 12.50-12.75 GHz (space-to-Earth).
- b) They operate with geostationary orbiting satellites;
- c) The equipment is installed on board aircraft for unattended operation;
- d) The AES emissions comply with the provisions of ETSI EN 302 186 [1] or similar technical specifications;
- e) The AES operations comply with the provisions of Recommendation ITU-R M.1643 [2] for the protection of the fixed service (FS), FSS and radio astronomy service (RAS).

There is a potential risk that radio transmissions from AES operating on the ground at airports could degrade the performance of electronic navigation and control equipment used on the ground and also on board other aircraft.

The electromagnetic compatibility between AES and aircraft avionics has been examined in ECC Report 272 on the "Earth Stations operating in the frequency bands 4-8 GHz, 12-18 GHz and 18-40 GHz in the vicinity of aircraft" [3]. This Report provides the maximum earth station e.i.r.p. levels to ensure compliance with aircraft High Intensity Radiated Field (HIRF) protection criteria.

Maximum e.i.r.p. levels for earth stations retained in this Decision are equal to or lower than maximum e.i.r.p. based on ECC Report 272 that ensures compliance with aircraft HIRF protection criteria. Therefore the maximum e.i.r.p. levels indicated in this Decision implicitly provides the necessary protection for aircraft HIRF.

3 REQUIREMENT FOR AN ECC DECISION

There is a need for an ECC Decision to allow for harmonised operation of AES in the frequency bands 14.0-14.5 GHz (Earth-to-space), 10.7-11.7 GHz (space-to-Earth) and 12.5-12.75 GHz (space-to-Earth).

ECC DECISION OF 24 JUNE 2005 ON THE FREE CIRCULATION AND USE OF AIRCRAFT EARTH STATIONS (AES) IN THE FREQUENCY BANDS 14.0-14.5 GHz (EARTH-TO-SPACE), 10.7-11.7 GHz (SPACE-TO-EARTH) AND 12.5-12.75 GHz (SPACE-TO-EARTH) (ECC/DEC/(05)11), AMENDED 6 MARCH 2015 AND AMENDED ON 8 MARCH 2019

“The European Conference of Postal and Telecommunications Administrations,

considering

- a) that the band 14-14.5 GHz is allocated to the mobile-satellite service (Earth-to-space) on a secondary basis in the ITU Radio Regulations (ITU RR) [4];
- b) that the band 14-14.5 GHz is allocated to the fixed satellite service (FSS) (Earth-to-space) on a primary basis in the ITU RRs [4];
- c) that the band 14.3-14.5 GHz is allocated to the fixed service (FS) on a primary basis in the ITU RR;
- d) that the band 14.25-14.3 GHz is additionally allocated to the FS on a primary basis in some European countries by the provisions of ITU RR No. 5.508 [4];
- e) that the radio astronomy service (RAS) is allocated on a secondary basis in the band 14.47-14.5 GHz where ITU RR No. 5.149 [4] applies. Annex 2 lists radio astronomy sites operating in the band 14.47-14.5 GHz in Europe;
- f) that in some CEPT countries stations of the FS are deployed in the band 14.25-14.5 GHz;
- g) that Recommendation ITU-R M.1643 [2] provides the technical and operational requirements for AES in the frequency band 14.0-14.5 GHz with regard to the protection of the FSS, the FS and sharing with the RAS;
- h) that the technical characteristics of the aeronautical mobile satellite service (AMSS) systems are covered by the international co-ordination of the relevant satellite systems;
- i) that AES in the 14 GHz range offer non-safety broad-band data services to users on board aircraft and operate in the frequency bands 10.7-11.7 GHz (space-to-Earth) and 12.5-12.75 GHz (space-to-Earth) on a non-protection basis and 14.0-14.5 GHz (Earth-to-space) on a secondary basis;
- j) that use of AES requires authorisation by the relevant national Administration and/or Civil Aviation Authority of the country where the aircraft is registered;
- k) that ECC Report 272 [3] provides the requirements established to ensure compliance with aircraft High intensity radiated field (HIRF) protection criteria;
- l) that in some countries, operation of AES when the aircraft is on the ground, is subject to prior agreement with administrations and/or airport authorities and/or Civil Aviation Authorities;
- m) that, over some countries additional limitations on the operation of AES at low altitudes will be necessary;
- n) that, for the purpose of resolving interference situations, AMSS network operators should provide a notification to the Office relating to the operation of their network;
- o) that, notwithstanding considering n), some administrations may require that the AMSS network operator obtains a frequency authorisation due to specific national requirements, while other administrations may require some form of notification, or exempt the AMSS network operator from these two requirements;
- p) that this Decision shall not impede EEA member countries from fulfilling their obligations according to Community law.

DECIDES

1. to designate the frequency bands 14.0-14.5 GHz (Earth-to-space), 10.7-11.7 GHz (space-to-Earth) and 12.5-12.75 GHz (space-to-Earth), for the harmonised use, inter alia, by AES, in accordance with considering i);
2. that CEPT **administrations shall**: inform the Office of their requirements relating to considerations l) and m) above, if any;
3. that this Decision applies only to AES in the bands referred to in Decides 1 which meet all the following conditions:
 - a) an e.i.r.p. not greater than 50 dBW;
 - b) authorised by the relevant administration of the country in which the aircraft is registered;
 - c) complying with the relevant European Telecommunication Standards (EN 302 186 [1]) which may be demonstrated by compliance with equivalent technical specifications (in the sense of art. 3(2) of the RE Directive [5]);
 - d) compliant with Recommendation ITU-R M.1643 [2], including the essential requirements in Part B and Part C of Annex 1, respectively relating to the protection of the fixed service (FS) and sharing of the radio astronomy service (RAS) and Aircraft Earth Stations taking due account of the Annexes to this Decision;
 - e) operating under the control of a network control facility.
4. that this Decision applies only to the AES of satellite networks for which the AES network operator has notified the Office regarding considering n) (see Annex 1) and that those AES operating within their systems comply with the requirements of this Decision including national requirements in relation to considering m). The notification information provided under Annex 1 by the AES network operators shall be accessible on the Office website <https://www.ecodocdb.dk/> and EFIS (<https://www.efis.dk/>);
5. that administrations shall permit operation of AES when the aircraft is in the proximity of or within airfields; such operation being subject to the provisions of this Decision including considering l) above;
6. that administrations shall allow free circulation and use of AES that satisfy the provisions of this Decision and considerations m) and n);
7. that, in addition to the notification for AES operators established in Annex 1, administrations shall not require AES network operators to obtain additional authorisations, subject to the provisions of this Decision and compliance with the requirements related to considering m), n) and o) above;
8. that this Decision shall enter into force on 6th March 2015;
9. that the preferred date for implementation of this Decision shall be 6th September 2015;
10. that administrations shall communicate the national measures implementing this Decision to the ECC Chairman and the Office when the Decision is nationally implemented including the information whether the uplink transmissions are only possible in sub bands of the 14-14.5 GHz.”

Note:

Please check the Office documentation database <https://www.ecodocdb.dk> for the up to date position on the implementation of this and other ECC Decisions.

ANNEX 1: PARAMETERS THAT NEED TO BE SUBMITTED BY AES NETWORK OPERATORS TO THE OFFICE

An AES network operator is required to submit to Office the following parameters and declaration.

A1.1 A DECLARATION THAT THEIR SYSTEM COMPLIES WITH THE REQUIREMENTS OF THE DECISION.

A1.2 THE AES NETWORK OPERATOR IS REQUIRED TO SUBMIT TO THE OFFICE THE FOLLOWING INFORMATION:

- Points of Contacts

- Network Operator's designated point of contact

- Title of contact
 - Postal address
 - Telephone and fax numbers
 - email address

- Network Control Facility (NCF) designated point of contact

- Title of contact
 - Postal address
 - Telephone and fax numbers
 - email address

- Technical Specification(s) of AES equipment type(s) used in the network

- AES Antenna

- Antenna type
 - Antenna size
 - Transmit peak gain
 - Max e.i.r.p. per carrier
 - Transmit frequency bands
 - Min. operating elevation
 - Antenna pointing accuracy

- Waveform characteristics

- Number(s) of carriers per AES
 - Occupied bandwidth(s) per carrier (as defined in Harmonised Standard EN 302 186 [1])
 - Carrier centre frequency(-ies)
 - Modulation
 - Multiple access scheme

- Operating details of each satellite

- ITU BR Filing Information

- ITU BR filing satellite network name
 - ITU BR circular reference number and date of publication (also to ESV)
 - Satellite operator(s) (commercial) name
 - GSO longitude (East or West from Greenwich)
 - Satellite service area (text description and/or a figure of the area)

- Forward Channel details (Satellite to AES)

- Transponder(s) downlink centre frequency
 - Transponder(s) downlink bandwidth

- Return Channel details (AES to satellite)

- Transponder(s) uplink centre frequency
 - Transponder(s) uplink bandwidth

- Other details

In addition the AES network operators' needs to notify the Office of the name of the airlines which will be using their network system. Alternatively, operators could provide to the Office a link to their webpage containing this information.

ANNEX 2: LIST OF RADIO ASTRONOMY¹ SITES OPERATING IN THE BAND 14.47 - 14.5 GHz IN EUROPE

-Badari	(51°45'27"N, 102°13'16"E)
-Effelsberg	(50°31'30"N, 06°53'00"E)
-Cambridge	(52°09'59"N, 00°02'20"E)
-Kalyazin	(57°13'22"N, 37°54'01"E)
-Kayseri	(38°59'45"N, 36°17'58"E)
-Fian Pushchino	(54°49'00"N, 37°40'00"E)
-Medicina	(44°31'14"N, 11°38'49"E)
-Noto	(36°52'33"N, 14°59'20"E)
-Sao Zelenchukskaya	(43°49'53"N, 41°35'32"E)
-Sardinia	(39°29'34"N, 09°14'42"E)
-Svetloe	(61°05'00"N, 29°46'54"E)

¹ any request for update of the list shall be notified to ECO and submitted to WG FM for approval and revision of the ECC Decision accordingly.

ANNEX 3: LIST OF REFERENCE

This annex contains the list of relevant reference documents.

- [1] ETSI EN 302 186 V2.1.1: "Satellite Earth Stations and Systems (SES); Harmonised Standard for satellite mobile Aircraft Earth Stations (AES) operating in the 11/12/14 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU"
- [2] Recommendation ITU-R M.1643: "Technical and operational requirements for aircraft earth stations of aeronautical mobile-satellite service including those using fixed-satellite service network transponders in the band 14-14.5 GHz (Earth-to-space)"
- [3] ECC Report 272: "Earth Stations operating in the frequency bands 4-8 GHz, 12-18 GHz and 18-40 GHz in the vicinity of aircraft"
- [4] ITU Radio Regulations, Edition of 2016
- [5] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC