Radio Spectrum Use Regulations of
Aeronautical Services

August 2023
Version 1
## Document Revision History

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**Version 1**                                   | August 2023 |
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1. Introduction

Based on the Communications and Information Technology Act issued by Royal Decree No. (M/106) dated 2/11/1443 AH, and Executive Bylaws, and the regulatory tasks assigned to the Communications, Space and Technology Commission, The National Frequency Plan has been developed to achieve optimal management of this national resource and its use by various services. In order to achieve the objectives of the National Frequency Plan; The Communications, Space and Technology Commission issued these regulations that include regulatory provisions related to aeronautical radio services. This is to ensure optimal use and effective management of frequency spectrum in the Kingdom of Saudi Arabia. This document also aims to:

- Efficient use of aeronautical radio spectrum resources through effective management in the Kingdom;
- Clear, transparent, comprehensive, forward-looking and non-discriminatory management of aeronautical radio spectrum;
- Enablement of emerging aeronautical radio technologies;
- Coordination of national and international activities in all matters related to Aeronautical radio spectrum including coordination with adjacent States;
- Enhanced quality of Aeronautical services provided in the Kingdom;
- Coordination with the relevant authorities to meet safety and operational requirements;

2. Definitions

The specific words and expressions defined in the Telecommunication and Information Technology Act and its Executive Bylaws and other regulations of CST shall have the same meaning when used in this document, unless stated otherwise. The following terms and expressions used in this document shall have the meaning specified hereunder:

2-1 ITU service definitions

2-1-1 Aeronautical Mobile Service (AMS): A mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may participate; emergency
position indicating radiobeacon stations may also participate in this service on designated
distress and emergency frequencies.

2-1-2 Aeronautical Mobile (Route) Service (AM(R)S): An aeronautical mobile service reserved for
communications relating to safety and regularity of flight, primarily along national or
international civil air routes.

2-1-3 Aeronautical Mobile (Off-Route) Service (AM(OR)S): An aeronautical mobile service intended for
communications, including those relating to flight coordination, primarily outside national or
international civil air routes.

2-1-4 Aeronautical Mobile Satellite Service (AMSS): A mobile satellite service in which mobile earth
stations are located on board aircraft; survival craft stations and emergency position indicating
radiobeacon stations may also participate in this service.

2-1-5 Aeronautical Mobile Satellite (Route) Service (AMS(R)S): An aeronautical mobile satellite service
reserved for communications relating to safety and regularity of flights, primarily along national
or international civil air routes.

2-1-6 Aeronautical Mobile Satellite (Off-Route) Service (AMS(OR)S): An aeronautical mobile-satellite
service intended for communications, including those relating to flight coordination, primarily
outside national and international civil air routes.

2-1-7 Aeronautical Radionavigation Service (ARNS): A radionavigation service intended for the benefit
and for the safe operation of aircraft.

2-1-8 Aeronautical Radionavigation Satellite Service (ARNSS): A radionavigation satellite service in
which earth stations are located on board aircraft.

2-1-9 Mobile Satellite Service (MSS): A radiocommunication service between mobile earth stations and
one or more space stations, or between space stations used by this service; or between mobile
earth stations by means of one or more space stations. This service may also include feeder links
necessary for its operation.

2-1-10 Radiolocation Service (RLS): A radiodetermination service for the purpose of radiolocation. The
term radiodetermination refers to the determination of the position, velocity and/or other
characteristics of an object, or the obtaining of information relating to these parameters, by
means of the propagation properties of radio waves.

2-1-11 Radionavigation Service (RNS): A radiodetermination service for the purpose of radionavigation.
2-2 Communications Navigation and Surveillance (CNS) system definitions

2-2-1 Aircraft Communications Addressing and Reporting System (ACARS): A digital data link system for the transmission of messages between aircraft and ground stations.

2-2-2 Airborne Collision Avoidance System (ACAS) / Traffic Alert and Collision Avoidance System (TCAS): On board surveillance system for pilots to determine the relative altitude and proximity of surrounding aircraft and provide warning if the risk of mid-air collision is present. TCAS is the term used to describe the equipment fitted to aircraft.

2-2-3 Airborne Weather Radar: A safety critical instrument used for avoiding potential hazardous weather conditions. It provides timely warnings of rapidly changing weather conditions as an aid to in-flight route planning.

2-2-4 Airborne Doppler Radar: A radar system used for specialised applications such as continuous determination of ground speed and drift angle information of an aircraft with respect to the ground as well as ground mapping.

2-2-5 Automatic Dependent Surveillance (ADS-B Out): A surveillance system where aircraft automatically provides, via a data link, identification and position data derived from on-board navigation and position fixing systems.

2-2-6 Airport Surface Detection Equipment (ASDE): A radar system that is used by aircraft controllers to assist in the safe manoeuvring of aircraft on the ground.

2-2-7 Distance Measuring Equipment (DME): Radio beacons that respond to an aircraft interrogation signal. The time between the interrogation and response is used to determine the slant path range between the aircraft and ground station.

2-2-8 Designated Operational Coverage (DOC): An area of defined dimensions in plan and elevation within which use of a specific frequency is coordinated and protected.

2-2-9 Instrument Landing System (ILS): Short-range guidance system for aircraft to approach a runway automatically.

2-2-10 Marker beacon: VHF radio beacons (outer, middle and inner marker) are used in conjunction with ILS to enable pilots to determine an aircraft position relative to a runway.

2-2-11 Microwave Landing System (MLS): A landing system operating in the microwave frequencies that provide precision guidance in azimuth, elevation and distance measurement to aircraft fitted with compatible airborne equipment.
2-2-12 Non-Directional Beacon (NDB): Short to medium range navigation system used for enroute and approach. NDB transmits non-directional signals containing the station identifier. These signals are received by the Automatic Direction Finder (ADF) equipment on board which gives the direction of aircraft relative to NDB.

2-2-13 Precision Approach Radar: Radar equipment used to determine the position of an aircraft during final approach, in terms of horizontal and vertical deviations.

2-2-14 Primary Surveillance Radar (PSR): A surveillance system that works on the principle of processing radio signals reflected from an aircraft to determine its position.

2-2-15 Radio Altimeter: A safety critical system used for measuring the aircraft’s absolute height above terrain immediately below the aircraft.

2-2-16 Unmanned Aircraft System (UAS): An aircraft system without pilot, crew or passengers on board. Unmanned Air Vehicle (UAV) is a component of UAS, which includes a ground-based controller and a system of communications with UAV.

2-2-17 Remotely Piloted Aircraft Systems (RPAS) – an aircraft flown by a remotely located pilot, see also UAS.

2-2-18 Secondary Surveillance Radar (SSR): A surveillance system that consists of a ground radar interrogating an Air Traffic Control (ATC) transponder installed on an aircraft. SSR determines the location data by analysing the received signal and provides access to the identification of the aircraft via the content of the response message.

2-2-19 VHF Data Link Mode 4 (VDL Mode 4): VHF data communications protocol enabling aircraft to exchange data with ground stations and other aircraft.

2-2-20 VHF Omni-directional Range (VOR): An aeronautical navigation system where the ground station transmits two VHF signals and the on-board receiver measures phase difference to locate the VOR relative to the aircraft.

2-2-21 Ground Based Augmentation System (GBAS): Ground base stations to receive navigation signals and accurately determine the position on the runway and provide information on the runway and wind to incoming aircraft that use GBAS to guide and land safely at the airport.

2-3 Other definitions

2-3-1 Communications, Space and Technology Commission (CST): The regulator of the information and communications technology and postal sector in the Kingdom of Saudi Arabia.
2-3-2 Designated Operational Coverage (DOC): The volume of airspace where the use of an assigned frequency is protected from interference from other frequency assignments. DOCs are expressed as a circle or a polygon with a maximum and a minimum flight level, therefore their geometrical forms are cylinders or prisms.

2-3-3 Effective isotropic radiated power (e.i.r.p.): Refers to the total power radiated by a hypothetical isotropic antenna in a single direction. E.i.r.p. corresponds to the maximum power emitted by the antenna in the direction with highest antenna gain.

2-3-4 Effective radiated power (e.r.p.): Refers to the total power radiated by an actual antenna relative to a half-wave dipole. As the half-wave dipole has a gain of 2.15 dB compared to an isotropic antenna, e.r.p. is equal to e.i.r.p. minus 2.15 dB.

2-3-5 Effective radiated peak envelope power (ERPEP): Represents the average power supplied to the antenna transmission line through a transmitter device during a single radio frequency cycle at the crest of the modulation in normal operating conditions.

2-3-6 Earth Stations In Motion (ESIM): Earth stations that communicate with geostationary-satellite orbit (GSO) systems operating in the fixed-satellite service (FSS) and operate on platforms in motion (e.g. aircraft) in the frequency ranges 17.7-20.2 GHz (space-to-Earth) and 27.5-30 GHz (Earth-to-space).

2-3-7 Global Navigation Satellite System (GNSS): A generic term to describe a constellation of satellites system that provides regional or global positioning, navigation, and time services.

2-3-8 General Authority of Civil Aviation (GACA): The civil aviation authority in the Kingdom of Saudi Arabia.

2-3-9 Medium Frequency (MF): Frequencies in the range 300 kHz – 3 MHz.

2-3-10 High Frequency (HF): Frequencies in the range 3 – 30 MHz.

2-3-11 Very High Frequency (VHF): Frequencies in the range 30 – 300 MHz.

2-3-12 International Telecommunication Union (ITU): Is the United Nations specialized agency, and it sets global standards for communications, information technology, and radio spectrum. It also sets the rules of the global radio spectrum and its uses with the participation of United Nations countries.
3. Scope of the Regulatory Document

3-1 The provisions of this regulatory document apply to all users of aeronautical radio services in the Kingdom.

3-2 This document covers frequency band identification and its regulations for aeronautical radio services for aircraft stations, ground stations, and radars for use in communications, navigation, surveillance and distress purposes in the Kingdom.

4. Aeronautical radiocommunications services and applications

4-1 Aeronautical radiocommunications are provided using various frequency bands which are allocated to a number of aeronautical radio services in the ITU Radio Regulations and National frequency plan in the Kingdom. These are

- Aeronautical mobile service;
- Aeronautical mobile (R) service – R: Route;
- Aeronautical mobile (OR) service – OR: Off-route;
- Aeronautical mobile satellite service;
- Aeronautical mobile satellite (R) service;
- Aeronautical mobile satellite (OR) service;
- Aeronautical radionavigation service; and
- Aeronautical radionavigation satellite service.

4-2 Aeronautical applications used for communications, navigation, and surveillance purposes are shown in table 1 below.

<table>
<thead>
<tr>
<th>Surveillance</th>
<th>Navigation</th>
<th>communications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Surveillance Radar (PSR):</td>
<td>Automatic Direction Finder (ADF)</td>
<td>(HF) communications</td>
</tr>
<tr>
<td>Secondary Surveillance Radar (SSR)</td>
<td>Distance Measuring Equipment (DME)</td>
<td>Satellite communications</td>
</tr>
<tr>
<td>Equipment</td>
<td>Description</td>
<td>Frequency Band</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Airborne Weather Radar</td>
<td>Global Navigation Satellite System (GNSS)</td>
<td>VHF communications</td>
</tr>
<tr>
<td>Search and rescue (EPIRBs)</td>
<td>Marker Beacons</td>
<td>Communications for search and rescue purposes</td>
</tr>
<tr>
<td>Airport Surface Detection Equipment (ASDE)</td>
<td>Radio altimeter</td>
<td>UHF communications</td>
</tr>
<tr>
<td>Doppler Radar</td>
<td>Non-Directional Beacon (NDB)</td>
<td></td>
</tr>
<tr>
<td>Automatic Dependent Surveillance (ADS-B Out)</td>
<td>VHF Omni-directional Range (VOR)</td>
<td></td>
</tr>
<tr>
<td>Airborne Collision Avoidance System (ACAS)</td>
<td>Instrument Landing System (ILS)</td>
<td></td>
</tr>
<tr>
<td>Traffic Alert and Collision Avoidance System (TCAS)</td>
<td>Microwave Landing System (MLS)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ground Based Augmentation System (GBAS)</td>
<td></td>
</tr>
</tbody>
</table>

4-3 Aeronautical services use specific frequency bands for aeronautical radio applications in accordance with the Radio Regulations issued by the International Telecommunication Union and Annex (10) of the Convention on International Civil Aviation. Appendix A shows the frequency bands allocated to aeronautical radio services, uses, bandwidth and international plans for Communications, Navigation and Surveillance applications.

5. Spectrum allocation and frequency assignment mechanism

5-1 The KSA national frequency allocation table defines the aeronautical services frequency bands and associated national and ITU RR footnotes.

5-2 Aeronautical frequency assignments are recorded in national databases maintained by CST and GACA. The following diagram illustrates the frequency assignment and registration process used for Aeronautical radiocommunications services.

---

1 NFP (cst.gov.sa)
6. International Coordination of Aeronautical Services

6-1 CST shall ensure that the frequencies registered in the ITU Master International Register of Frequencies (ITU MIFR) accurately reflects the National Register of Frequencies by submitting the necessary notifications and any subsequent amendments to the Radiocommunication Bureau.

6-2 Frequencies registered in ITU MIFR are granted international recognition that protects them from harmful radio interference.

6-3 Non-internationally coordinated frequency allocations shall not cause harmful interference, and shall not require protection against harmful radio interference caused by allocations used in accordance with the relevant provisions.

Figure 1: Frequency assignment and registration process
The role of GACA is to register frequencies to ICAO in accordance with the relevant agreements, regulations and annexes. GACA is working to ensure that the internationally registered frequencies are an accurate reflection of the frequency register with GACA AIP.

7. Licence categories

CST issues licences for aeronautical radio services under four licence categories as illustrated in table 2. Licensing provisions are described for each licensing category and published as part of license application procedures.

<table>
<thead>
<tr>
<th>Licence category</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft station radio licence</td>
<td>All radio equipment on board of aircraft</td>
</tr>
<tr>
<td>Aeronautical ground station radio licence</td>
<td>Licensing the use of frequencies at the station level for a specific frequency channel and a specific location</td>
</tr>
<tr>
<td>Aeronautical radar ground station radio licence</td>
<td>Licensing the use of frequencies at the station level for a specific frequency channel and a specific location</td>
</tr>
<tr>
<td>Aeronautical navigation aid ground station radio licence</td>
<td>Licensing the use of frequencies at the station level for a specific frequency channel and a specific location</td>
</tr>
</tbody>
</table>

7-1 Aircraft station radio licence:

7-1-1 An aircraft station radio licence allows a licence holder to use all radio equipment specified in the licence for communication, navigation and surveillance applications subject to applicable license conditions. The main equipment types covered under the aircraft station radio licence include:

7-1-1-1 Automatic Direction Finder (ADF),
7-1-1-2 Distance Measuring Equipment (DME),
7-1-1-3 Air Traffic Control (ATC) transponder,
7-1-1-4 Global Positioning System (GPS),
7-1-1-5 HF Communications,
7-1-1-6 Marker Beacons,
7-1-1-7 Radio Altimeter,
7-1-1-8 Satellite Communications,
7-1-1-9 Airborne Collision Avoidance System (ACAS) / Traffic Alert and Collision Avoidance System (TCAS),
7-1-1-10 VHF Communications,
7-1-1-11 VHF Navigation Receivers,
7-1-1-12 VHF Portable Radios and Weather Radar.

7-2 Aeronautical ground-station radio licence

7-2-1 The aeronautical ground station radio licence covers the use of aeronautical frequencies to provide ground to air voice and data communications. Each licence specifies all radio equipment deployed at the ground station used to provide the following main types of ground to air communications services.

7-2-1-1 Two-way communications between an aircraft and a ground station where the ground operator provides, for example, aerodrome weather information or control instructions to the aircraft, etc.

7-2-1-2 Aeronautical broadcast where a ground station broadcasts information, for example, relating to the aerodrome or weather to aircrafts.

7-2-1-3 Data communications, e.g. VHF data link, aircraft communications addressing and reporting system.

7-2-1-4 Emergency communications, e.g. fire, search and rescue.

7-3 Aeronautical radar ground station radio licence

7-3-1 Aeronautical radar ground station radio licence covers the installation and use of

7-3-1-1 Primary Surveillance Radar (PSR) systems, and
7-3-1-2 Secondary Surveillance Radar (SSR) systems.
7-3-1-3 Automatic Dependent Surveillance (ADS-B Out)
Aeronautical navigation aid ground station radio licence

7-4-1 Aeronautical navigation aid ground station radio licence covers navigation applications, which enable the licence holder to install and use aeronautical navigation aids. The main types of navigation aids covered by the licence include:

7-4-1-1 Non-Directional Beacon (NDB),
7-4-1-2 Distance Measuring Equipment (DME),
7-4-1-3 VHF Omni-directional Range (VOR),
7-4-1-4 Instrument Landing System (ILS), and
7-4-1-5 Microwave Landing System (MLS).

8. Eligibility

8-1 The provisions of this regulatory document apply to a Saudi national or a resident of the Kingdom, a legal entity registered in the Kingdom, or a government entity.

8-2 The provisions of this regulatory document apply to those who have received approval from GACA to register the aircraft in the aircraft register in the Kingdom and where the equipment meets the GACA approval requirements. Subject to GACA authorisation and approval ground station licences can be applied for by an authorized representative of the Saudi air navigation services company, airport operators in the kingdom and aircraft operator (airlines) and operators of helicopter landing sites, or an authorized representative of a government entity who is responsible for air operations at government-owned sites.

9. Licence duration

9-1 Aeronautical radio services licences are issued for a period ranging from one-year to five-years.

9-2 Aeronautical radio services licences are automatically renewed upon termination of the license.
10. Renewal, cancellation or modification of the licences

10-1 The holder of the license shall submit to CST a request for amendment in case of the need to amend any of the license data issued by CST.

10-2 CST will coordinate with the licensee in the event of amending or revoking the licence with providing the justifications for the action. CST will then determine a reasonable notice to notify the licensee of the procedure, taking into consideration the general status of the licence.

10-3 CST and GACA will coordinate licence renewal processes to ensure aviation and spectrum requirements are maintained.

10-4 The licence shall be considered cancelled when the licensee requests to cancel the licence, and he shall not dispose of the devices except with the approval of CST.

10-5 CST may, at its sole discretion, cancel the licenses of aeronautical radiocommunications services if the devices and frequencies allocated to them are not used in accordance with the terms and conditions contained in the license and CST will send an enforcement notice requiring immediate cessation of transmission.

10-6 CST may, at its sole discretion, cancel the license request if the financial fee is not paid within (3) three months of the invoice date.

10-7 CST may, at its sole discretion, choose to amend or revoke any licences whenever for the following reasons:

10-8-1 Conformity with international regulations that have changed and decisions made by regional and international telecommunications organizations,

10-8-2 Inefficient use of radio spectrum,

10-8-3 Causing undue interference or using unauthorized wireless equipment,

10-8-4 Conformity with the relevant regulations of the Kingdom, and

10-8-5 Ensure that all information provided for the license request correct and accurate.
11. Service Level Agreement (SLA)

11-1 The Communications, Space and Technology Commission aims to process requests for issuance, modification and cancellation of a license for aeronautical services within the time periods indicated in Appendix B.

12. Rights and obligations related to licences

12-1 Aeronautical radio services licence holders must ensure that all licensed radio equipment is constructed and used only in accordance with the provisions specified in the documentation issued by CST and GACA. In particular, licence holders must

12-1-1 Ensure that all information supplied for the licence application is true and accurate.

12-1-2 Operate spectrum stations at licensed frequencies within technical parameters specified in the licence.

12-1-3 Not allow any unauthorised person to operate licensed stations.

12-1-4 Ensure that licensed equipment does not cause interference to any other radio stations or equipment lawfully owned, used or operated. The licensee must allow CST and GACA to inspect the licensed equipment as part of interference investigations.

12-1-5 Maintain up-to-date records of all licensed equipment including manufacturer, model, serial number, output power. The records should be made available for inspection by CST and GACA when requested.

12-1-6 Submit up-to-date records of all licensed equipment before the licence renewal.

12-1-7 Inform and obtain approval of CST and GACA regarding any proposed changes to the licence in advance. These can only be implemented after the appropriate documentation has been varied and/or reissued accordingly.

12-1-8 Ensure that licensed stations are available for inspection at all reasonable times by CST and GACA.

12-1-9 Pay the licence fee.

12-1-10 Not transfer the licence unless a written approval is obtained from CST.

12-1-11 Comply with any notifications issued by CST from time to time.

12-1-12 Any other action that violates the provisions of the Act, the Executive Bylaws, or the regulatory decisions of CST.
12-2 CST issues a penalty in accordance with Chapter (9) of the Communications and Information Technology Regulation issued by Royal Decree No. (M/106) dated 2/11/1443 AH for any violation of these regulations, which leads to harmful radio interference.

12-3 CST shall coordinate with the relevant authorities to ensure that the frequency assignment process meets the requirements of spectrum regulation and air navigation, and is in compliance with the standards of the International Telecommunication Union and the International Civil Aviation Organization. CST will ensure that the necessary notifications are sent to the International Telecommunication Union for the registration of aeronautical stations.

13 Electromagnetic Compatibility Analysis

13-1 CST has the right to conduct electromagnetic compatibility analysis of aeronautical services devices and may seek the assistance of an external party to perform the analysis as needed. The objective of the electromagnetic compatibility analysis is to ensure that the devices comply with the technical conditions associated with the license application and to examine the possibility of any radio interference affecting current licensees. CST has the right to reject the license application when such interference is demonstrated, and it may propose alternative frequencies or alternative technical conditions.

14 Frequency Usage Fees

14-1 The use of spectrum based on a Frequency Usage License is subject to annual Frequency Usage Fees, calculated pursuant to the provisions of the document “Frequency Usage Fees in the Kingdom of Saudi Arabia”, available on CST’s website.

15 General Provisions

15-1 CST will review this document periodically, and CST has the right to update it in accordance with the national and international requirements related to the frequency spectrum allocated to aeronautical services.

15-2 All aeronautical devices must comply with the technical specifications published by CST on its website. The requirements of the regulations for licensing communications and information technology equipment must be met, and the regulatory decisions of CST.
# Appendix A: Frequency allocations for aeronautical services and typical applications for aeronautical bands

Aeronautical services use specific frequency bands for aeronautical radio applications in accordance with the Radio Regulations issued by the International Telecommunication Union and Annex (I0) of the Convention on International Civil Aviation. Table A.1 shows the frequency bands allocated to aeronautical radio services, uses, bandwidth and international plans for communications applications.

**Table A.1: Aeronautical frequency bands and usage (Communications)**

<table>
<thead>
<tr>
<th>Band</th>
<th>Service</th>
<th>Usage</th>
<th>Bandwidth</th>
<th>International Plans</th>
<th>Air / Ground / Both usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2850 - 3025 kHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 27 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>3025 - 3155 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>3400 - 3500 kHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 27 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>3800 - 3900 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>3900 - 3950 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>4650 - 4700 kHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 27 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>4700 - 4750 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>Band</td>
<td>Service</td>
<td>Usage</td>
<td>Bandwidth</td>
<td>International Plans</td>
<td>Air / Ground / Both usage</td>
</tr>
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<tr>
<td>4750 – 4850 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>5450 – 5480 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>5480 – 5680 kHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 27 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>5680 – 5730 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>6525 – 6685 kHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 27 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>6685 – 6765 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>8815 – 8965 kHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 27 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>8965 – 9040 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>10005 – 10100 kHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Long range communications (voice and data)</td>
<td>3 kHz</td>
<td>Appendix 27 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td>Band</td>
<td>Service</td>
<td>Usage</td>
<td>Bandwidth</td>
<td>International Plans</td>
<td>Air / Ground / Both usage</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------</td>
<td>--------------------------------</td>
<td>-----------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>11275 - 11275 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(voice and data)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11275 - 11400 kHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Long range communications</td>
<td>3 kHz</td>
<td>Appendix 27 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(voice and data)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13200 - 13260 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(voice and data)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13260 - 13360 kHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Long range communications</td>
<td>3 kHz</td>
<td>Appendix 27 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(voice and data)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15010 - 15100 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(voice and data)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17900 - 17970 kHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Long range communications</td>
<td>3 kHz</td>
<td>Appendix 27 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(voice and data)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17970 - 18030 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(voice and data)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21924 - 22000 kHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Long range communications</td>
<td>3 kHz</td>
<td>Appendix 27 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(voice and data)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23200 - 23350 kHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Long range communications</td>
<td>3 kHz</td>
<td>Appendix 26 of the Radio Regulations Provisions on the International Telecommunication Union (ITU)</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(voice and data)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>112 – 117.975 MHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>VDL Mode 4</td>
<td></td>
<td>ICAO Annex 10 Volume III</td>
<td>Both</td>
</tr>
<tr>
<td>117.975 – 137 MHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Air-ground and air-air</td>
<td>8.33 kHz</td>
<td>ICAO Annex 10 Volume III and V. ICAO 9718 Volume II Appendix B</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td></td>
<td>communications (voice and data)</td>
<td>25 kHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Band</td>
<td>Service</td>
<td>Usage</td>
<td>Bandwidth</td>
<td>International Plans</td>
<td>Air / Ground / Both usage</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------------------------------</td>
<td>------------------------------------------------</td>
<td>-----------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>138 – 144 MHz</td>
<td>AERONAUTICAL MOBILE (OR)</td>
<td>Military use – Annex 10 and ICAO 9718 does not provide use data for this band.</td>
<td></td>
<td></td>
<td>Both</td>
</tr>
<tr>
<td>960 – 1164 MHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Air-ground communications</td>
<td></td>
<td>AM(R) service limited to systems that operate in accordance with recognised international standards – use in accordance with WRC-12 Resolution 417</td>
<td>Both</td>
</tr>
<tr>
<td>1525 – 1559 MHz</td>
<td>MOBILE SATELLITE (S-E)</td>
<td>Satellite communications (air-ground communications for AMS(R)S services)</td>
<td>5 – 200 kHz</td>
<td></td>
<td>Both</td>
</tr>
<tr>
<td>1559 – 1626.5 MHz</td>
<td>MOBILE SATELLITE AERONAUTICAL RADIONAVIGATION (E-S)</td>
<td>Satellite communications (1610 – 1626.5 MHz)</td>
<td>5 – 200 kHz</td>
<td></td>
<td>Both</td>
</tr>
<tr>
<td>1626.5 – 1660.5 MHz</td>
<td>MOBILE SATELLITE AERONAUTICAL RADIONAVIGATION</td>
<td>Satellite communications (air-ground communications for AMS(R)S services)</td>
<td>5 – 200 kHz</td>
<td></td>
<td>Both</td>
</tr>
<tr>
<td>5030 – 5150 MHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>Unmanned Aircraft Systems (UAS)</td>
<td>20 MHz</td>
<td></td>
<td>Both</td>
</tr>
<tr>
<td>5000 – 5150 MHz</td>
<td>AERONAUTICAL MOBILE SATELLITE (R)</td>
<td>Unmanned Aircraft Systems (UAS)</td>
<td>20 MHz</td>
<td></td>
<td>Both</td>
</tr>
</tbody>
</table>
Aeronautical services use specific frequency bands for aeronautical radio applications in accordance with the Radio Regulations issued by the International Telecommunication Union and Annex (10) of the Convention on International Civil Aviation. Table A.2 shows the frequency bands allocated to aeronautical radio services, uses, bandwidth and international plans for navigation applications.

Table A.2: Aeronautical frequency bands and usage (Navigation)

<table>
<thead>
<tr>
<th>Band</th>
<th>Service</th>
<th>Usage</th>
<th>Bandwidth</th>
<th>International Plans</th>
<th>Air / Ground / Both usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>255 – 526.5 kHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Non-directional beacon (NDB)</td>
<td>1 – 2 kHz</td>
<td>ICAO Annex 10 Volume I, ITU GE85-R1-AER Plan</td>
<td>Both</td>
</tr>
<tr>
<td>74.8 – 75.2 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Marker beacon</td>
<td>0.4 – 3 kHz</td>
<td>ICAO Annex 10 Volume I</td>
<td>Both</td>
</tr>
<tr>
<td>108 – 117.975 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Very High Omnidirectional Range (VOR)</td>
<td>50 – 200 kHz (VOR)</td>
<td>VOR 108–117.975 MHz (ICAO Annex 10 Volume I and V and ICAO 9718 Volume II)</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instrument Landing System (ILS) - localiser</td>
<td>5 – 14 kHz (ILS localiser)</td>
<td>ILS 108–112 MHz (ICAO Annex 10 Volume I and ICAO 9718 Volume II)</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>25 kHz (GBAS)</td>
<td>GBAS 108–117.975 MHz (ICAO Annex 10 Volume I and ICAO 9718 Volume II)</td>
<td>Both</td>
</tr>
<tr>
<td>223 – 230 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Instrument landing system (ILS)</td>
<td>4 – 32 kHz (ILS glide path)</td>
<td>ICAO Annex 10 Volume I and ICAO 9718 Volume II</td>
<td>Both</td>
</tr>
<tr>
<td>230 – 235 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Instrument landing system (ILS)</td>
<td>4 – 32 kHz (ILS glide path)</td>
<td>ICAO Annex 10 Volume I and V and ICAO 9718 Volume II</td>
<td>Both</td>
</tr>
<tr>
<td>328.6 – 335.4 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Instrument landing system (ILS)</td>
<td>4 – 32 kHz (ILS glide path)</td>
<td>ICAO Annex 10 Volume I and ICAO 9718 Volume II</td>
<td>Both</td>
</tr>
<tr>
<td>960 – 1164 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Distance measuring equipment (DME)</td>
<td>2 – 6 MHz (DME)</td>
<td>ICAO 9718 Volume II, ICAO Annex 10 Volume I and V</td>
<td>Both</td>
</tr>
<tr>
<td>Band</td>
<td>Service</td>
<td>Usage</td>
<td>Bandwidth</td>
<td>International Plans</td>
<td>Air / Ground / Both usage</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------------</td>
<td>---------------------------------------------------</td>
<td>--------------------</td>
<td>--------------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>1164 – 1215 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION RADIONAVIGATION SATELLITE</td>
<td>Global navigation satellite system (GNSS) Distance measuring equipment (DME)</td>
<td>2 – 6 MHz (DME) 8 – 24 MHz (GNSS)</td>
<td>DME (ICAO Annex 10 Volume I and V, ICAO 9718 Volume II)</td>
<td>Both</td>
</tr>
<tr>
<td>1300 – 1350 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION RADIONAVIGATION SATELLITE</td>
<td>Global navigation satellite system (GNSS)</td>
<td>8 – 24 MHz (GNSS)</td>
<td></td>
<td>Both</td>
</tr>
<tr>
<td>1559 – 1626.5 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION RADIONAVIGATION SATELLITE</td>
<td>Global navigation satellite system (GNSS) (1559 – 1610 MHz)</td>
<td>8 – 24 MHz (GNSS)</td>
<td>GNSS (ICAO Annex 10 Volume I)</td>
<td>Both</td>
</tr>
<tr>
<td>4200 – 4400 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Radio altimeter</td>
<td>200 MHz</td>
<td></td>
<td>Air</td>
</tr>
<tr>
<td>5000 – 5250 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Microwave Landing System (MLS)²</td>
<td>300 kHz</td>
<td>ICAO Annex 10 Volume I</td>
<td>Both</td>
</tr>
</tbody>
</table>

Aeronautical services use specific frequency bands for aeronautical radio applications in accordance with the Radio Regulations issued by the International Telecommunication Union and Annex (10) of the Convention on International Civil Aviation. Table A.3 shows the frequency bands allocated to aeronautical radio services, uses, bandwidth and international plans for surveillance applications.

Table A.3: Aeronautical frequency bands and usage (Surveillance)

<table>
<thead>
<tr>
<th>Band</th>
<th>Service</th>
<th>Usage</th>
<th>Bandwidth</th>
<th>International Plans</th>
<th>Air / Ground / Both usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2850 – 3025 kHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>The frequency (3023) kHz is intended for search and rescue</td>
<td></td>
<td>ICAO Annex 10 Volume V</td>
<td>Both</td>
</tr>
<tr>
<td>5480 – 5680 kHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>The frequency 5680 kHz is intended for search and rescue</td>
<td></td>
<td>ICAO Annex 10 Volume V</td>
<td>Both</td>
</tr>
<tr>
<td>117.975 – 137 MHz</td>
<td>AERONAUTICAL MOBILE (R)</td>
<td>The Frequencies (121.5, 123.1 and 243)</td>
<td></td>
<td>ICAO Annex 10 Volume V</td>
<td>Both</td>
</tr>
</tbody>
</table>

² Actual use is up to 5150 MHz
<table>
<thead>
<tr>
<th>MHz Range</th>
<th>Service Type</th>
<th>Frequency Use</th>
<th>Source</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>406 - 406.1 MHz</td>
<td>MOBILE SATELLITE</td>
<td>Search and rescue (EPIRBs)</td>
<td>ICAO Annex 10 Volume V</td>
<td>Both</td>
</tr>
<tr>
<td>960 – 1164 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Secondary Surveillance Radar (SSR)</td>
<td>SSR, ACAS, ADS-B and UAT (ICAO 9718 Volume II)</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Airborne collision avoidance system (ACAS)</td>
<td>SSR (ICAO Annex 10 Vol IV)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Universal access transceiver (UAT) (978MHz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Automatic Dependent Surveillance-Broadcast (ADS-B Out)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SSR, ACAS and ADS-B use 1030 and 1090 MHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1300 – 1350 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Primary Surveillance Radar (PSR)</td>
<td>Ground</td>
<td></td>
</tr>
<tr>
<td>2700 – 2900 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Primary Surveillance Radar (PSR)</td>
<td>1 – 6 MHz</td>
<td>Ground</td>
</tr>
<tr>
<td>2900 – 3100 MHz</td>
<td>RADIONAVIGATION</td>
<td>Primary Surveillance Radar (PSR)</td>
<td>Ground</td>
<td></td>
</tr>
<tr>
<td>3100 – 3300 MHz</td>
<td>RADIOLOCATION</td>
<td>Radar use under national defence</td>
<td>Both</td>
<td></td>
</tr>
<tr>
<td>5350 – 5470 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Airborne Weather radar and ground mapping</td>
<td>Air</td>
<td></td>
</tr>
<tr>
<td>8750 – 8850 MHz</td>
<td>AERONAUTICAL RADIONAVIGATION</td>
<td>Airborne Doppler radar</td>
<td>Air</td>
<td></td>
</tr>
<tr>
<td>Frequency Range</td>
<td>Service</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>---------</td>
<td>-------------</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 9000 – 9200 MHz | AERONAUTICAL RADIONAVIGATION, RADIONAVIGATION | PSR systems (including Precision approach radar and Airport Surface Detection Equipment (ASDE))  
9000 – 9200 MHz restricted to ground-based radars and to associated airborne transponders which transmit only on frequencies in these bands when activated by radars operating in the same band.  
Airborne weather radar in 9300 – 9500 MHz | Both |
| 13.25 – 13.4 GHz | RADIONAVIGATION | Airborne Doppler radar | 1 – 6 MHz | Air |
| 15.4 – 15.7 GHz | AERONAUTICAL RADIONAVIGATION, RADIOLOCATION | PSR systems (including Precision approach radar and Airport Surface Detection Equipment (ASDE))  
Airborne weather radar and ground mapping in 15.5 – 15.7 GHz | Both |
| 31.8 – 33.4 GHz | RADIONAVIGATION | Airport Surface Detection Equipment (ASDE) | | Ground |
## Appendix B: Service level Agreement

Table B.2: Service level agreement of aeronautical radio service licensing

<table>
<thead>
<tr>
<th>Service requested</th>
<th>Service level agreement (working day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issuing a new licence</td>
<td>20</td>
</tr>
<tr>
<td>Amending an existing licence</td>
<td>20</td>
</tr>
<tr>
<td>Revoking a licence</td>
<td>10</td>
</tr>
</tbody>
</table>
Appendix C: Channel Plans

There are several channel plans associated with aeronautical services\(^3\).

Appendix 26 Plan

The allotment plan covers the aeronautical mobile (OR) service in the following frequency bands:

- 3025 – 3155 kHz
- 3900 – 3950 kHz
- 4700 – 4750 kHz
- 5680 – 5730 kHz
- 6685 – 6765 kHz
- 8965 – 9040 kHz
- 11175 – 11275 kHz
- 13200 – 13260 kHz
- 15010 – 15100 kHz
- 17970 – 18030 kHz

The plan has the following carrier frequencies (in kHz) allotted to KSA:

- 3026
- 3029
- 3035
- 3038
- 3077
- 3080
- 3092
- 3095
- 4700
- 4703
- 4709
- 4736
- 4739
- 5693
- 5696
- 6685
- 6691
- 6694
- 6697
- 6700
- 6721
- 6724
- 6727
- 6730
- 6757
- 6760
- 8968
- 8971
- 8977
- 8980
- 8995
- 9010
- 9013
- 11196
- 11199
- 11268
- 11271
- 13203
- 13206
- 15019
- 15022
- 15025
- 17982

\(^3\) Frequency plans (itu.int)
Appendix 27 Plan

The plan covers the aeronautical mobile (R) service in the following frequency bands:

- 2850 – 3025 kHz
- 3400 – 3500 kHz
- 4650 – 4700 kHz
- 5450 – 5480 kHz
- 5480 – 5680 kHz
- 6525 – 6685 kHz
- 8815 – 8965 kHz
- 10005 – 10100 kHz
- 11275 – 11400 kHz
- 13260 – 13360 kHz
- 17900 – 17970 kHz
- 21924 – 22000 kHz

Frequency allotments are defined for the following geographic area categories:

- Major World Air Route Areas (MWARAs)
- Regional and Domestic Air Route Areas (RDARAs)
- VOLMET areas
- Worldwide areas

The following areas within each category listed above cover the KSA territory either partially or entirely:

- Major World Air Route Area - MIDDLE EAST (MWARA-MID), AFRICA (MWARA-AFI) and INDIAN OCEAN (MWARA-INO)
- Regional and Domestic Air Route Area – 5A and 5C (RDARA-5A and RDARA-5C)
• VOLMET Area - MIDDLE EAST (MID-MET) and AFRICA-INDIAN OCEAN (AFI-MET)

• Worldwide Area V

For these areas, the plan has the following carrier frequencies (in kHz) allocated to KSA. For any restrictions associated with the use of these frequencies, Table provided under Clause 27/218 in Appendix 27 should be used. Also note that the carrier frequencies 3023 kHz and 5680 kHz are intended for common use on a worldwide basis. Clauses related to the use of these two frequencies are provided in Article 3 of Appendix 27.

Table C.1: The frequencies allotted for the geographical areas that cover the territory of the Kingdom of Saudi Arabia either partially or completely according to the Appendix 27 plan.

<table>
<thead>
<tr>
<th>MWARA-MID</th>
<th>MWARA-AFI</th>
<th>MWARA-INO</th>
<th>RDARA-5A</th>
<th>RDARA-5C</th>
<th>MID-MET</th>
<th>AFI-MET</th>
<th>Worldwide V</th>
</tr>
</thead>
<tbody>
<tr>
<td>2944</td>
<td>2851</td>
<td>3476</td>
<td>2986</td>
<td>2905</td>
<td>2956</td>
<td>2860</td>
<td>3013</td>
</tr>
<tr>
<td>2992</td>
<td>2878</td>
<td>5634</td>
<td>3452</td>
<td>3452</td>
<td>5589</td>
<td>3404</td>
<td>5532</td>
</tr>
<tr>
<td>3467</td>
<td>3419</td>
<td>8879</td>
<td>5577</td>
<td>5583</td>
<td>8945</td>
<td>5499</td>
<td>5538</td>
</tr>
<tr>
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<td></td>
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</tr>
</tbody>
</table>
GE85-R1-AER Plan

The plan covers the following aeronautical radionavigation service (radiobeacons) frequency bands.

- 415 - 435 kHz
- 510 - 526.5 kHz

The carrier frequencies (in kHz) associated with the plan are as follows.

- 416
- 417
- 418
- 419
- 420
- 421
- 422
- 423
- 424
- 425
- 426
- 427
- 429
- 430
- 431
- 432
- 433
- 434
- 511
- 513
- 514
- 515
- 516
- 517
- 519
- 520
- 521
- 522
- 523
- 524
- 525
- 526

ICAO Plans

The ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation Volume II provides regional allotment plans for the band 118 – 137 MHz. The plan for the Middle East region is shown below.
ICAO Annex 10 Volume I Radio Navigation Aids and Volume V Aeronautical Radio Frequency Spectrum Utilization detail the relevant criteria in respect of channeling and pairing appropriate to aeronautical systems, which are also part of the ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation Volume II. Example frequency channeling data is provided below for illustrative purposes.

Localiser/glide path frequency pairing
Figure C.1: Localiser/glide path frequency pairing
VOR preferred order when making frequency assignments

Table C.2: VOR channel plan

<table>
<thead>
<tr>
<th>Order</th>
<th>Band (MHz)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>111.975–117.975</td>
<td>Ending in odd tenths of a megahertz (“100” kHz channels), for example 112.100 MHz, 112.300 MHz and 112.500 MHz</td>
</tr>
<tr>
<td>2</td>
<td>111.975–117.975</td>
<td>Ending in even tenths of a megahertz (“100” kHz channels), for example 112.200 MHz, 112.400 MHz and 112.600 MHz</td>
</tr>
<tr>
<td>3</td>
<td>108.000–111.975</td>
<td>Ending in even tenths of a megahertz (“100” kHz channels), for example 108.200 MHz, 108.400 MHz and 108.600 MHz</td>
</tr>
<tr>
<td>4</td>
<td>111.975–117.975</td>
<td>Ending in odd tenths of a megahertz plus 50 kHz (“50” kHz channels), for example 112.150 MHz, 112.350 MHz and 112.550 MHz</td>
</tr>
<tr>
<td>5</td>
<td>111.975–117.975</td>
<td>Ending in even tenths of a megahertz plus 50 kHz (“50” kHz channels), for example 112.050 MHz, 112.250 MHz and 112.450 MHz</td>
</tr>
<tr>
<td>6</td>
<td>108.000–111.975</td>
<td>Ending in even tenths of a megahertz plus 50 kHz (“50” kHz channels), for example, 108.250 MHz, 108.450 MHz and 108.650 MHz</td>
</tr>
</tbody>
</table>
DME channeling arrangement

Figure C.2: DME channeling arrangement
DME channel pairing with ILS or VOR

Table C.3: DME channel pairing with ILS or VOR

<table>
<thead>
<tr>
<th>DME channel</th>
<th>Paired with</th>
<th>Navigation aid</th>
</tr>
</thead>
<tbody>
<tr>
<td>18X–56X (even numbers)</td>
<td>108.100–111.900 MHz</td>
<td>ILS localizer, 100 kHz</td>
</tr>
<tr>
<td>18Y–56Y (even numbers)</td>
<td>108.150–111.950 MHz</td>
<td>ILS localizer, 50 kHz</td>
</tr>
<tr>
<td>19X–55X (odd numbers)</td>
<td>108.200–111–800 MHz</td>
<td>VOR, 100 kHz</td>
</tr>
<tr>
<td>19Y–55Y (odd numbers)</td>
<td>108.250–111.850 MHz</td>
<td>VOR, 50 kHz</td>
</tr>
<tr>
<td>57X–89X</td>
<td>112.000–112.200 MHz</td>
<td>VOR, 100 kHz</td>
</tr>
<tr>
<td>57Y–59Y</td>
<td>112.050–112.250 MHz</td>
<td>VOR, 50 kHz</td>
</tr>
<tr>
<td>70X–126X</td>
<td>112.300–117.900 MHz</td>
<td>VOR, 100 kHz</td>
</tr>
<tr>
<td>70Y–126Y</td>
<td>112.350–117.950 MHz</td>
<td>VOR, 50 kHz</td>
</tr>
</tbody>
</table>

SSR frequency utilisation

Figure C.3: SSR frequency utilisation

It should be noted that there are other channeling arrangements defined for other frequency bands in ICAO Annex 10. The details are not replicated within this document as the ICAO documents are extant.
Appendix D: Technical Specifications

All devices must comply with the technical specifications published by the Communications, Space and Technology Commission on its website. Appendix D 1, Appendix D 2, Appendix D 3 show the technical specifications of aeronautical devices.
Appendix D.1

Specification for air communications equipment

Document Number: RI XXX
Revision: Issue xx
Date: TBD

Issued by The Communications, Space and Technology Commission of Saudi Arabia in accordance with article 84 of the Telecommunications Bylaw.

Communications, Space and Technology Commission (CST)
P.O Box 75606 – Riyadh 11588 - Kingdom of Saudi Arabia

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Website: www.cst.gov.sa
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Scope

This specification applies to air communications equipment.

Enforcement

This specification shall enter into force on XX/XX/2022.

Any previous version of this technical specification is withdrawn.

General Requirements

- All equipment must comply with the requirement of CST specification GEN001, be safe and must not adversely affect other electrical equipment.
- All telecommunications and radio terminal equipment must comply with the relevant technical specifications established by CST. In addition, such equipment may be subject to regulations for Declaration of Conformity or registration. Please visit www.cst.gov.sa for details.
- If more than one interface type is offered by a piece of equipment, each interface must meet the applicable technical specifications.
- It is mandatory that test reports are obtained from a laboratory that has been accredited by a body that is a member of the ILAC Mutual Recognition Arrangement.
- Notwithstanding other regulatory requirements, all equipment is to be inspected and maintained to the level necessary to ensure compliance with CST regulations and spectrum licence conditions.
Limits and conditions

Testing should be carried out to ensure compliance with the listed specifications.

<table>
<thead>
<tr>
<th>Frequency band</th>
<th>Max output power of magnetic field</th>
<th>Usage</th>
<th>Standard</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2850 – 22000 kHz</td>
<td>Subject to licensing</td>
<td>Ground based HF aeronautical radio equipment for voice and data link communications</td>
<td>ICAO Annex 10 Volume III</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peak envelope power &lt; 6 kW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peak envelope power for FIB emissions &lt; 1.5 kW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>108 – 117.975 MHz</td>
<td>Subject to licensing</td>
<td>Ground based VHF aeronautical radio equipment for analogue voice; and ACARS, Mode 2 and Mode 4 data link communications</td>
<td>EN 301 841-1 EN 301 842-1 EN 300 676</td>
<td></td>
</tr>
<tr>
<td>117.975 – 137 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Licensing Requirements

A spectrum license is required.

Additional Requirements

GACA Regulations, in particular GACAR Part 173, are to be complied with.
The equipment must comply with Radio Spectrum Use Regulations of Aeronautical Services.
References

The following referenced documents are indispensable for the application of this document. If no issue or revision number is quoted along with the title of a technical specification or standard, the latest published version should be used.

EN 300 676

Ground-based VHF hand-held, mobile and fixed radio transmitters, receivers and transceivers for the VHF aeronautical mobile service using amplitude modulation; Part 2: Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU.

EN 301 841-1

VHF air-ground Digital Link (VDL) Mode 2; Technical characteristics and methods of measurement for ground-based equipment; Part 1: Physical layer and MAC sub-layer.

EN 301 842-1

VHF air-ground Digital Link (VDL) Mode 4 radio equipment; Technical characteristics and methods of measurement for ground-based equipment; Part 1: EN for ground equipment.

EUROCAE ED-78A

Guidelines for Approval of the Provision and Use of Air Traffic Services supported by Data Communications
EUROCAE ED-100A

Interoperability Requirements for ATS Applications using Arinc 622 Data Communications.

EUROCAE ED-120

Safety and Performance Requirements Standard For Initial Air Traffic Data Link Services In Continental Airspace (SPR IC).

ICAO Annex 10 Volume III

Communication Systems.

ICAO Annex 10 Volume V


ICAO Doc 9694-AN/955

Manual Of Air Traffic Services Data Link Applications.

ICAO Doc 9741

Manual on HF Data Link.

ICAO Doc 9776
Manual on VHF Digital Link (VDL) Mode 2.

ICAO Doc 9816


GACAR Part 173

Aeronautical telecommunications services.

History

For reference, the latest versions of the technical specifications are published on the CST website [www.cst.gov.sa](http://www.cst.gov.sa).

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
<td>Specification of air communications equipment</td>
<td>Issue 1</td>
<td>XX/XX/2022</td>
</tr>
</tbody>
</table>
Appendix D.2

Specification for air navigation and surveillance equipment

Document Number: RI 090
Revision: Issue 03
Date: XX/XX/2023

Issued by The Communications, Space and Technology Commission of Saudi Arabia in accordance with article 84 of the Telecommunications Bylaw.

Communications, Space and Technology Commission (CST)

P.O Box 75606 – Riyadh 11588 - Kingdom of Saudi Arabia

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E-mail: info@cst.gov.sa
Website: www.cst.gov.sa
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Scope

This specification applies to air navigation and surveillance equipment.

Enforcement

This specification shall enter into force on XX/XX/2023.

Any previous version of this technical specification is withdrawn.

General Requirements

- All equipment must comply with the requirement of CST specification GEN001, be safe and must not adversely affect other electrical equipment.
- All telecommunications and radio terminal equipment must comply with the relevant technical specifications established by CST. In addition, such equipment may be subject to regulations for Declaration of Conformity or registration. Please visit www.cst.gov.sa for details.
- If more than one interface type is offered by a piece of equipment, each interface must meet the applicable technical specifications.
- It is mandatory that test reports are obtained from a laboratory that has been accredited by a body that is a member of the ILAC Mutual Recognition Arrangement.
- Notwithstanding other regulatory requirements, all equipment is to be inspected and maintained to the level necessary to ensure compliance with CST regulations and spectrum licence conditions.

Limits and conditions

Testing should be carried out to ensure compliance with the listed specifications.
<table>
<thead>
<tr>
<th>Frequency band</th>
<th>Max output power of magnetic field</th>
<th>Usage</th>
<th>Standard</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>190 – 1750 kHz (mainly under 535 kHz)</td>
<td>Subject to licensing</td>
<td>Ground based NDB equipment</td>
<td>ICAO Annex 10 Volume I</td>
<td>A more detailed description is included in ICAO Annex 10 Volume I Chapter 3.4.</td>
</tr>
<tr>
<td>75 MHz</td>
<td>Subject to licensing</td>
<td>Ground based VHF Marker beacons</td>
<td>ICAO Annex 10 Volume I</td>
<td>A more detailed description is included in ICAO Annex 10 Volume I Chapter 3.6.</td>
</tr>
<tr>
<td>108 – 111.975 MHz</td>
<td>Subject to licensing</td>
<td>Ground based ILS localiser radio equipment</td>
<td>ICAO Annex 10 Volume I</td>
<td>A more detailed description is included in ICAO Annex 10 Volume I Chapter 3.1.</td>
</tr>
<tr>
<td>108 – 117.975 MHz</td>
<td>Subject to licensing</td>
<td>Ground based VOR and DVOR equipment</td>
<td>ICAO Annex 10 Volume I</td>
<td>A more detailed description is included in ICAO Annex 10 Volume I Chapter 3.3.</td>
</tr>
<tr>
<td>108 – 117.975 MHz</td>
<td>Subject to licensing</td>
<td>GBAS equipment</td>
<td>ICAO Annex 10 Volume I</td>
<td>A more detailed description is included in ICAO Annex 10 Volume I Attachment D Section 7.</td>
</tr>
<tr>
<td>328.6 – 335.4 MHz</td>
<td>Subject to licensing</td>
<td>Ground based ILS glide path radio equipment</td>
<td>ICAO Annex 10 Volume I</td>
<td>A more detailed description is included in ICAO Annex 10 Volume I Chapter 3.1.</td>
</tr>
<tr>
<td>960 – 1215 MHz</td>
<td>Subject to licensing</td>
<td>Ground based DME equipment</td>
<td>ICAO Annex 10 Volume I</td>
<td>A more detailed description is included in ICAO Annex 10 Volume I Chapter 3.5.</td>
</tr>
<tr>
<td>Frequency Range</td>
<td>Licensing Requirement</td>
<td>Technology</td>
<td>Reference</td>
<td>Additional Information</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-----------------------</td>
<td>-----------------------------------------</td>
<td>------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1030 MHz and 1090 MHz</td>
<td>Subject to licensing</td>
<td>Secondary surveillance radar (SSR) for air traffic control</td>
<td>ICAO Annex 10 Volume IV</td>
<td>A more detailed description is included in ICAO Annex 10 Volume IV Chapter 3.</td>
</tr>
<tr>
<td>1215 – 1350 MHz, 2700 – 3300 MHz, 9000 – 9500 MHz and 15.4 – 15.7 GHz</td>
<td>Subject to licensing</td>
<td>Primary surveillance radar for air traffic control (PSR)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>5030 – 5091 MHz</td>
<td>Subject to licensing</td>
<td>Ground based MLS equipment</td>
<td>ICAO Annex 10 Volume I</td>
<td>A more detailed description is included in ICAO Annex 10 Volume I Chapter 3.11</td>
</tr>
</tbody>
</table>

**Licensing Requirements**

A spectrum license is required.

**Additional Requirements**

GACA Regulations, in particular GACAR Part 173, are to be complied with.

The equipment must comply with Radio Spectrum Use Regulations of Aeronautical Services.
References

The following referenced documents are indispensable for the application of this document. If no issue or revision number is quoted along with the title of a technical specification or standard, the latest published version should be used.

ICAO Annex 10 Volume I
Radio Navigation Aids.

ICAO Annex 10 Volume IV
Surveillance and Collision Avoidance Systems.

ITU-R Rec. SM. 329
Unwanted emissions in the spurious domain.

ITU-R Rec. SM. 1541
Unwanted emissions in the out-of-band domain.

GACAR Part 173
Aeronautical telecommunications services.
History

For reference, the latest versions of the technical specifications are published on the CST website [www.CST.gov.sa](http://www.CST.gov.sa).

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<td>10/01/2010</td>
</tr>
<tr>
<td></td>
<td>Issue 2</td>
<td>10/07/2021</td>
</tr>
<tr>
<td>Review of air navigation equipment and inclusion of air surveillance equipment</td>
<td>Issue 3</td>
<td>XX/XX/2023</td>
</tr>
</tbody>
</table>
Appendix D.3

Specification for ground, sea and airborne model control equipment

Document Number: RI 051
Revision: Issue 03
Date: XX/XX/2023

Issued by The Communications, Space and Technology Commission of Saudi Arabia in accordance with article 84 of the Telecommunications Bylaw.

Communications, Space and Technology Commission (CST)
P.O Box 75606 – Riyadh 11588 - Kingdom of Saudi Arabia

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Scope

This specification applies to ground, sea and airborne model control equipment.

Enforcement

This specification shall enter into force on XX/XX/2023.

Any previous version of this technical specification is withdrawn.

General Requirements

- All equipment must comply with the requirement of CST specification GEN001, be safe and must not adversely affect other electrical equipment.
- All telecommunication and radio terminal equipment must comply with the relevant technical specifications established by CST. In addition, such equipment may be subject to regulations for Declaration of Conformity or registration. Please visit www.cst.gov.sa for details.
- If more than one interface type is offered by a piece of equipment, each interface must meet the applicable technical specifications.
- It is mandatory that test reports are obtained from a laboratory that has been accredited by a body that is a member of the ILAC Mutual Recognition Arrangement.

Limits and conditions

Testing should be carried out to ensure compliance with the listed specifications.

<table>
<thead>
<tr>
<th>Frequency band</th>
<th>Max output power of magnetic field</th>
<th>Usage</th>
<th>Standard</th>
<th>Comments</th>
</tr>
</thead>
</table>


<table>
<thead>
<tr>
<th>Frequency Range</th>
<th>Power or Equipment</th>
<th>Description</th>
<th>EN Numbers</th>
<th>Channel Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.96 - 27.28 MHz</td>
<td>100 mW e.r.p.</td>
<td>Telecommand for remote control of the model control equipment</td>
<td>EN 300 220-1</td>
<td>10 kHz, the first channel centre frequency is 26.965 MHz, channel numbers 1 – 32.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EN 300 220-2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EN 301 489-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Telecommand for remote control of the airborne model control equipment only</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34.945 - 35.305 MHz</td>
<td>100 mW e.r.p. Licence-exempt</td>
<td><strong>Telecommand for remote control of the airborne model control equipment only</strong></td>
<td>EN 300 220-1</td>
<td>10 kHz, the first channel centre frequency is 34.95 MHz, channel numbers 1 – 36.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EN 300 220-2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EN 301 489-3</td>
<td></td>
</tr>
<tr>
<td>40.66 - 41.00 MHz</td>
<td>100 mW e.r.p. Licence-exempt</td>
<td><strong>Telecommand for remote control of the model control equipment on the ground, on water or under the water</strong> Airborne use is not permitted</td>
<td>EN 300 220-1</td>
<td>10 kHz, the first channel centre frequency is 40.665 MHz, channel numbers 1 – 34.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EN 300 220-2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EN 301 489-3</td>
<td></td>
</tr>
<tr>
<td>433.05 - 434.79 MHz</td>
<td>1 mW e.r.p. Licence-exempt</td>
<td>Telemetry to provide data from the model only.</td>
<td>EN 300 220-1</td>
<td>25 kHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EN 300 220-2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EN 301 489-3</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>Power {e.r.p.}</td>
<td>Description</td>
<td>Compliance Standards</td>
<td>Channel Spacing</td>
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<td>-------------</td>
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<tr>
<td>434.04 – 434.79 MHz</td>
<td>10 mW</td>
<td>Telemetry to provide data from the model only, including airborne models</td>
<td>EN 300 220-1 EN 300 220-2 EN 301 489-3</td>
<td>25 kHz</td>
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</table>

**Licensing Requirements**

There is no licence requirement.

**Additional Requirements**

For airborne models, the equipment must be registered with GACA and an operating licence must be obtained. GACA regulations (e.g. GACAR 101) should be complied with.

The equipment must comply with Radio Spectrum Use Regulations of Aeronautical Services.
References

The following referenced documents are indispensable for the application of this document. If no issue or revision number is quoted along with the title of a technical specification or standard, the latest published version should be used.

EN 300 220-1

Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 1: Technical characteristics and methods of measurement.

EN 300 220-2

Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 2: Harmonised Standard for access to radio spectrum for non-specific radio equipment.

EN 301 489-3

Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard for Electromagnetic Compatibility.

History

For reference, the latest versions of the technical specifications are published on the CST website www.cst.gov.sa.
<table>
<thead>
<tr>
<th>Description</th>
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<td></td>
<td>11/03/2006</td>
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<td>Issue 3</td>
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<td><strong>Update of existing data and Inclusion of additional frequency bands</strong></td>
<td>Issue 4</td>
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