



PLENARY MEETING

**Addendum 2 to
Document 6043-E
3 October 2023
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African Common Proposals

PROPOSALS FOR THE WORK OF THE CONFERENCE

Agenda item 1.2

1.2 to consider identification of the frequency bands 3 300-3 400 MHz, 3 600-3 800 MHz, 6 425-7 025 MHz, 7 025-7 125 MHz and 10.0-10.5 GHz for International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution **245 (WRC-19)**;

Introduction

This Agenda item addresses the determination of technical, operational and regulatory issues for the use of terrestrial component of International Mobile Telecommunications (IMT) in the frequency bands 3 300-3 400 MHz (amend footnote in Region 1, Region 2) 3 600-3 800 MHz (Region 2), 6 425-7 025 MHz (Region 1), 7 025-7 125 MHz (globally), and 10.0-10.5 GHz (Region 2) while taking into account the protection of services to which the frequency bands are allocated on a primary basis, without imposing additional regulatory or technical constraints on those services, and also, as appropriate, on services in adjacent bands.

- **Band 1: 3 300-3 400 MHz (Region 1)**

This frequency band is already identified for IMT in 33 African countries through RR No.

5.429B. However, this footnote contains stringent conditions including:

- A geographical limitation “limited to administrations south of 30° parallel north...”
- A secondary status for IMT with regard to Radiolocation service, “IMT shall not cause harmful interference to, or claim protection from, systems in the radiolocation service...”
- Explicit agreement is needed for the implementation of IMT “administrations shall obtain the agreement of neighbouring countries...”

IMT take up in the continent would be facilitated if the conditions for use in footnote No. **5.429B**, such as geographical limitation, explicit agreement from neighbouring countries, and if IMT use was not subject to no interference no protection from radiolocation.

Therefore, the ATU Member States support a primary allocation to the mobile service in the frequency band 3 300-3 400 MHz by adding the frequency band in the Table of Frequency Allocation for Region 1 and the identification of the frequency band for IMT. No specific additional conditions should be considered for this identification.

- **Band 2: 3 300-3 400 MHz (Region 2) and Band 3: 3 600-3 800 MHz (Region 2)**

These frequency bands are not for direct consideration for the African Region. However, since global identification of a frequency band for IMT would foster global harmonisation and economies of scale for the implementation of IMT, the ATU Member States support primary allocation to mobile service, and possible IMT identification in these frequency bands under consideration in Region 2.

- **Band 4: 6 425-7 025 MHz (Region 1)**

The 6 425 – 7 125 MHz frequency band was initially proposed by African countries at WRC-19. Results of the survey conducted among ATU member states, as agreed by APM23-2, indicated that the frequency band 6 425-7 125 MHz is mainly used within Africa for Fixed and Fixed-Satellite services, and highlighting the need to ensure their protection. ITU-R studies have concluded that coexistence is feasible for co-channel scenario between IMT and the fixed service by means of site-by-site coordination, if the two systems are deployed in the same or in adjacent geographical areas. Several studies showed that coexistence is feasible between IMT and FSS (uplink), including AP30B allotment, when considering certain assumptions. Nevertheless, some other studies, using different assumptions, concluded that the protection criteria for FSS uplink is not met.

Following a careful consideration of the results of coexistence studies carried out by ITU-R, the ATU Member States support the identification of the frequency band 6 425-7 125 MHz for IMT, while considering appropriate measures to ensure the protection of the existing services.

- **Band 5: 7 025-7 125 MHz (globally)**

As for the frequency band 4 above, this frequency range was also proposed by African countries at WRC-19 for identification for the implementation of IMT. Results of the survey conducted among ATU member states, as agreed by APM23-2, indicated that the frequency band 6 425-7 125 MHz is mainly used within Africa for Fixed and Fixed-Satellite services, and highlighting the need to ensure their protection. ITU-R studies have concluded that coexistence is feasible for co-channel scenario between IMT and the fixed service by means of site-by-site coordination, if the two systems are deployed in the same or in adjacent geographical areas. Several studies showed that coexistence is feasible between IMT and FSS (uplink), including AP30B allotment, when considering certain assumptions. Nevertheless, some other studies, using different assumptions, concluded that the protection criteria for FSS uplink is not met.

Following a careful consideration of the results of coexistence studies carried out by ITU-R, the ATU Member States support the identification of the frequency band 6 425-7 125 MHz for IMT, while considering appropriate measures to ensure the protection of the existing services.

- **Band 6 (10.0-10.5 GHz (Region 2))**

The view of the ATU Member States is that IMT identification of this frequency band or part thereof in Region 2, shall not affect services to which this frequency band is allocated in Region 1.

Proposal

To satisfy this Agenda item, the ATU Member States are proposing the following regulatory provisions :

- **Band 1: 3 300-3 400 MHz (Region 1)**

Primary allocation to the mobile service in the frequency band 3 300-3 400 MHz by adding the frequency band in the Table of Frequency Allocations for Region 1 and a new footnote for identification of this frequency band for the implementation of IMT. This will also entails deleting the existing footnotes No. **5.429A**.

- **Band 4: 6 425-7 025 MHz (Region 1)**

Identification of the frequency band 6 425-7 025 MHz in Region 1 for IMT by creating a new RR footnote associated with a draft new WRC Resolution containing the conditions that apply to ensure the coexistence with the existing primary services operating in the same band. The protection of FSS uplink would be achieved by defining a spectrum mask based defining limit on the expected e.i.r.p. of an IMT base station. The protection of FSS downlink in the frequency band 6 700-7 075 MHz can be achieved through the adoption of site-specific coordination.

- **Band 5: 7 025-7 125 MHz (globally)**

Identification of the frequency band 7 025-7 125 MHz in all Regions for IMT by creating a new RR footnote associated with a draft new WRC Resolution containing the conditions that apply to ensure the coexistence with the existing primary services operating in the same band. The protection of FSS uplink would be achieved by defining a spectrum mask based defining limit on the expected e.i.r.p. of an IMT base station. The protection of FSS downlink in the frequency band 6 700-7 075 MHz can be achieved through the adoption of site-specific coordination.:

Regulatory proposals for Band 1, Band 4 and Band 5 are presented below.

ARTICLE 5

Frequency allocations

Section IV – Table of Frequency Allocations (See No. 2.1)

MOD AFCP/6043A2/1

2 700-3 600 MHz

Allocation to services		
Region 1	Region 2	Region 3
<p>3 300-3 400 MOBILE RADIOLOCATION</p> <p>5.149 5.429 5.429B 5.430 ADD 5.A12-1F</p>	<p>3 300-3 400 RADIOLOCATION Amateur Fixed Mobile</p> <p>5.149 5.429C 5.429D</p>	<p>3 300-3 400 RADIOLOCATION Amateur</p> <p>5.149 5.429 5.429E 5.429F</p>

Reasons: To reflect the primary allocation to the mobile service of the frequency band 3 300 - 3 400 MHz in Region 1 and the new footnote addressing the identification of the frequency band for the implementation of IMT.

SUP AFCP/6043A2/2

5.429A

Reasons: A new footnote is proposed to the identification of the frequency band 3 300- 3 400 MHz for the implementation of IMT. Hence, this provision can be suppressed.

ADD AFCP/6043A2/3

5.A12-1F In Region 1, the frequency band 3 300-3 400 MHz is identified for International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. The use of this frequency band shall be in accordance with Resolution **223 (Rev.WRC-19)**. (WRC-23)

Reasons: This new footnote would replace the existing footnote No. **5.429A** with more relaxed conditions for the implementation of IMT in thus frequency band.

MOD AFCP/6043A2/4

5 570-6 700 MHz

Allocation to services		
Region 1	Region 2	Region 3
5 925-6 700	FIXED 5.457 FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B MOBILE 5.457C ADD 5.B12-4C 5.149 5.440 5.458	

Reasons: To include a new footnote with regards for the identification of the frequency band 6 425-7 025 MHz for the implementation of the IMT.

ADD AFCP/6043A2/5

5.B12-4C In Region 1, the frequency band 6 425-7 025 MHz is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. Resolution [A2-6GHz] (WRC-23) applies. (WRC-23)

Reasons: This new provision provides for the identification of the frequency band 6 425-7 025 MHz in Region 1 for the implementation of the IMT associated with a draft new resolution containing the requirements for ensuring the coexistence of the IMT with the existing services and applications.

MOD AFCP/6043A2/6

6 700-7 250 MHz

Allocation to services		
Region 1	Region 2	Region 3
6 700-7 075	FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441 MOBILE ADD 5.C12-5C 5.458 5.458A 5.458B	
7 075-7 145	FIXED MOBILE ADD 5.C12-5C 5.458 5.459	

Reasons: To include a new footnote with regards for the identification of the frequency band 7 025-7125 MHz in all Regions for the implementation of the IMT.

ADD AFCP/6043A2/7

5.C12-5C The frequency band 7 025-7 125 MHz, or portions thereof, is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. Resolution [A2-6GHz] (WRC-23) applies. (WRC-23)

Reasons: This new provision provides for the global identification of the frequency band 7 025-7 125 MHz for the implementation of the IMT associated with a draft new resolution containing the requirements for ensuring the coexistence of the IMT with the existing services and applications.

ADD AFCP/6043A2/8

DRAFT NEW RESOLUTION [A2-6GHz] (WRC-23)

Terrestrial component of International Mobile Telecommunications in the frequency bands 6 425-7 025 MHz in Region 1 and 7 025-7 125 MHz in all Regions

The World Radiocommunication Conference (Dubai, 2023),

considering

- a)* that International Mobile Telecommunications (IMT), including IMT-2000, IMT-Advanced and IMT-2020, is the ITU vision of global mobile access, and is intended to provide telecommunication services on a worldwide scale, regardless of location and type of network or terminal;
- b)* that harmonized worldwide frequency bands for IMT are desirable in order to achieve global roaming and the benefits of economies of scale;
- c)* that identification of frequency bands allocated to the mobile service for IMT may change the sharing situation regarding applications of services to which the frequency band is already allocated, and may require regulatory actions;
- d)* that the ITU Radiocommunication Sector (ITU-R) has studied, in preparation for WRC-23, sharing and compatibility with services allocated in the frequency bands 6 425-7 025 MHz and 7 025-7 125 MHz, and their adjacent bands, as appropriate, based on characteristics available at that time, and results may change if these characteristics change;
- e)* that it is assumed that a very limited number of IMT base stations will be communicating with a positive elevation angle towards IMT indoor mobile stations;
- f)* that the frequency band 6 425-7 125 MHz, or part thereof, is allocated on a primary basis to the fixed, mobile, fixed-satellite (Earth-to-space and space-to-Earth) and space operation services (Earth-to-space);
- g)* that, under No. **5.458**, passive microwave sensor measurements are carried out over the oceans in the frequency band 6 425-7 075 MHz, and passive microwave sensor measurements are carried out in the band 7 075-7 250 MHz;
- h)* that, in the frequency band 6 650-6 675.2 MHz, radio astronomy observations are carried out under No. **5.149**,

noting

- a)* Resolutions **223 (Rev.WRC-19)**, **224 (Rev.WRC-19)**, **225 (Rev.WRC-12)**, **241 (WRC-19)**, **242 (WRC-19)** and **243 (WRC-19)**, which also relate to IMT;

b) that the IMT terrestrial radio interfaces as defined in Recommendations ITU-R M.1457, ITU-R M.2012 and ITU-R M.2150 are expected to evolve within the framework of ITU-R beyond those initially specified, to provide enhanced services and services beyond those envisaged in the initial implementation;

c) that ITU-R has developed its vision defining the framework and overall objectives of IMT towards 2030 and beyond to drive the future developments for IMT;

d) that ITU-R is studying the application of No. **21.5** to IMT stations that use an antenna that consists of an array of active elements,

recognizing

a) that the identification of a frequency band for IMT does not establish priority in the Radio Regulations and does not preclude the use of the frequency band by any application of the services to which it is allocated;

b) that studies have shown that the protection of feeder links for the non-geostationary-satellite orbit (non-GSO) fixed-satellite service (FSS) (space-to-Earth) requires the determination of protection distances ranging between a few kilometres to tens of kilometres. These protection distances are site-specific and depend on several elements, such as the propagation parameters, local terrain topography, station and orbital parameters of the feeder links for non-GSO FSS (space-to-Earth);

d) that the frequency band 6 425-7 125 MHz is expected to be implemented as of 1 January 2024, in time to help meet the spectrum requirement of IMT-2020 systems and beyond,

resolves

1 that administrations wishing to implement IMT consider use of the frequency bands 6 425-7 025 MHz identified for IMT in No. **5.B12-4C** in Region 1 and 7 025-7 125 MHz identified for IMT in all Regions in No. **5.C12-5C**, taking into account the latest relevant ITU-R Recommendations;

2 that administrations wishing to implement IMT in the frequency band 6 425-7 075 MHz shall apply the following conditions to IMT to ensure the protection, continued use and future development of the fixed-satellite service (Earth-to-space):

2.1 the level of expected equivalent isotropically radiated power (e.i.r.p.) emitted by an IMT base station as a function of vertical angle above the horizon in the frequency band 6 425-7 075 MHz or parts thereof shall not exceed the following values:

Vertical angle measurement window $\theta_L \leq \theta < \theta_H$ (vertical angle θ above horizon)	Expected e.i.r.p. (dBm/MHz) (NOTE 1)
$0^\circ \leq \theta < 5^\circ$	32
$5^\circ \leq \theta < 10^\circ$	28
$10^\circ \leq \theta < 15^\circ$	24
$15^\circ \leq \theta < 20^\circ$	24
$20^\circ \leq \theta < 30^\circ$	20
$30^\circ \leq \theta < 60^\circ$	18
$60^\circ \leq \theta \leq 90^\circ$	17

NOTE 1: The expected e.i.r.p. is defined as the average value of the e.i.r.p., with the averaging being performed:

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- over horizontal angles between -180° to $+180^\circ$, and the IMT base station beamforming in a specific direction within its steering range,
 - over different beamforming directions within the IMT base station steering range, and
 - over the specified vertical angle measurement window ($\theta_L \leq \theta < \theta_H$).

2.2 (not used)

3 that administrations wishing to implement IMT in the frequency band 6 700-7 075 MHz shall ensure the protection, continued use and future development of the fixed-satellite service (space-to-Earth) through the adoption of site-specific coordination;

3bis that IMT within the frequency range 6 700-7 075 MHz shall not be used by aeronautical applications,

encourages administrations

1 to ensure that provisions for the implementation of IMT does not adversely affect the operation of FSS earth stations and their future development;

2 to keep the antenna pattern of IMT base stations within the limits of the approximation envelope according to Recommendation ITU-R M.2101 and to implement suppression side lobe mitigation techniques;

3 to take all practicable steps to protect the radio astronomy service from harmful interference in the frequency band 6 650-6 675.2 MHz, which covers spectral lines of importance for current astronomical investigations, in accordance with No. **5.149**,

invites administrations

to take into account the benefits of harmonized utilization of the spectrum for the terrestrial component of IMT,

invites the ITU Radiocommunication Sector

1 to develop harmonized frequency arrangements to facilitate IMT deployment in the frequency bands 6 425-7 025 MHz in Region 1 and 7 025-7 125 MHz in all Regions;

2 to continue providing guidance to ensure that IMT can meet the telecommunication needs of developing countries;

3 to develop a Recommendation to address methods for the determination of the protection area around a non-GSO earth station in the frequency band 6 700-7 075 MHz, from an IMT base station;

4 to regularly review, as appropriate, the impact of evolving technical and operational characteristics of IMT systems (including base-station density) on sharing and compatibility with space services, and to take into account the results of these reviews in the development and/or revision of ITU-R Recommendations/Reports addressing, *inter alia*, if necessary, applicable measures to mitigate the risk of interference into space services;

5 to develop a Recommendation to address methods for the determination of the protection area around existing radio astronomy service stations from IMT stations in the frequency band 6 650-6 675.2 MHz;

6 to update existing ITU-R Recommendations/Reports or develop new ITU-R Recommendations, as appropriate, to provide information and assistance to the concerned administrations on possible coordination of fixed service stations with IMT stations in the frequency band 6 425-7 125 MHz,

instructs the Director of the Radiocommunication Bureau

to bring this Resolution to the attention of relevant international organizations.

Reasons: This new resolution provided the guidance to administrations on specific technical and regulatory conditions that should apply to ensure the coexistence of the IMT systems with the existing services.

SUP

RESOLUTION 245 (WRC-19)

**Studies on frequency-related matters for the terrestrial component of
International Mobile Telecommunications identification in the frequency bands
3 300-3 400 MHz, 3 600-3 800 MHz, 6 425-7 025 MHz,
7 025-7 125 MHz and 10.0-10.5 GHz**