

I n t e r n a t i o n a l T e l e c o m m u n i c a t i o n U n i o n

**WORLD
RADIOCOMMUNICATION
CONFERENCE
PROVISIONAL FINAL ACTS**

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Nomenclature

Section I – Frequency and wavelength bands

MOD COM6/382/1 (B20/414/1)

2.1 The radio spectrum shall be subdivided into nine frequency bands, which shall be designated by progressive whole numbers in accordance with the following table. As the unit of frequency is the hertz (Hz), frequencies shall be expressed:

- in kilohertz (kHz), up to and including 3 000 kHz;
- in megahertz (MHz), above 3 MHz, up to and including 3 000 MHz;
- in gigahertz (GHz), above 3 GHz, up to and including 3 000 GHz.

However, where adherence to these provisions would introduce serious difficulties, for example in connection with the notification and registration of frequencies, the lists of frequencies and related matters, reasonable departures may be made¹.

¹ **2.1.1** In the application of the Radio Regulations, the Radiocommunication Bureau uses the following units:

kHz	for frequencies up to 28 000 kHz inclusive
MHz	for frequencies above 28 000 kHz up to 10 500 MHz inclusive
GHz	for frequencies above 10 500 MHz.

ARTICLE 5

Frequency allocations

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

{DELETED}

MOD COM4/296/1 (B9/305/5) (R4/335/5)

2 700-4 800 MHz

Allocation to services		
Region 1	Region 2	Region 3
4 400-4 500	FIXED MOBILE ADD 5.4B01	
4 500-4 800	FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE ADD 5.4B01	

ADD COM4/296/4 (B9/305/6) (R4/335/6)

5.4B01 In Region 2 (except Brazil, Cuba, French Overseas Departments and Communities, Guatemala, Paraguay, Uruguay and Venezuela), and in Australia, the band 4 400-4 940 MHz may be used for aeronautical mobile telemetry for flight testing by aircraft stations (see No. **1.83**). Such use shall be in accordance with Resolution [COM4/2] (WRC-07) and shall not cause harmful interference to, nor claim protection from, the fixed-satellite and fixed services. Any such use does not preclude the use of these bands by other mobile service applications or by other services to which these bands are allocated on a co-primary basis and does not establish priority in the Radio Regulations. (WRC-07)

MOD COM4/296/5 (B9/305/8) (R4/335/8)

5.442 In the bands 4 825-4 835 MHz and 4 950-4 990 MHz, the allocation to the mobile service is restricted to the mobile, except aeronautical mobile, service. In Region 2 (except Brazil, Cuba, Guatemala, Paraguay, Uruguay and Venezuela), and in Australia, the band 4 825-4 835 MHz is also allocated to the aeronautical mobile service, limited to aeronautical mobile telemetry for flight testing by aircraft stations. Such use shall be in accordance with Resolution [COM4/2] (WRC-07) and shall not cause harmful interference to the fixed service. (WRC-07)

MOD COM4/380/4 (B17/404/11)

5.444 The band 5 030-5 150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. In the band 5 030-5 091 MHz, the requirements of this system shall take precedence over other uses of this band. For the use of the band 5 091-5 150 MHz, No. **5.444A** and Resolution **114 (Rev.WRC-03)** apply. (WRC-07)

MOD PLEN/420/1

5.444 The band 5 030-5 150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. The requirements of this system shall take precedence over other uses of this band. For the use of this band, No. **5.444A** and Resolution **114 (Rev.WRC-03)** apply. (WRC-03)

MOD PLEN/420/2

5.444A *Additional allocation:* the band 5 091-5 150 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis. This allocation is limited to feeder links of

non-geostationary mobile-satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**.

In the band 5 091-5 150 MHz, the following conditions also apply:

- prior to 1 January 2018, the use of the band 5 091-5 150 MHz by feeder links of non-geostationary-satellite systems in the mobile-satellite service shall be made in accordance with Resolution **114 (Rev.WRC-03)**;
- prior to 1 January 2018, the requirements of existing and planned international standard systems for the aeronautical radionavigation service which cannot be met in the 5 000-5 091 MHz band, shall take precedence over other uses of this band;
- after 1 January 2016, no new assignments shall be made to earth stations providing feeder links of non-geostationary mobile-satellite systems;
- after 1 January 2018, the fixed-satellite service will become secondary to the aeronautical radionavigation service. (WRC-03)

MOD COM4/380/5 (B17/404/12)

5.444A *Additional allocation:* the band 5 091-5 150 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis. This allocation is limited to feeder links of non-geostationary mobile-satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**.

In the band 5 091-5 150 MHz, the following conditions also apply:

- prior to 1 January 2018, the use of the band 5 091-5 150 MHz by feeder links of non-geostationary-satellite systems in the mobile-satellite service shall be made in accordance with Resolution **114 (Rev.WRC-03)**;
- after 1 January 2012, no new assignments shall be made to earth stations providing feeder links of non-geostationary mobile-satellite systems;
- after 1 January 2018, the fixed-satellite service will become secondary to the aeronautical radionavigation service. (WRC-07)

ADD COM4/380/6 (B17/404/13)

5.4B03 The use of the band 5 091-5 150 MHz by the aeronautical mobile service is limited to:

- systems operating in the aeronautical mobile (R) service and in accordance with international aeronautical standards, limited to surface applications at airports. Such use shall be in accordance with Resolution [**COM4/4**] (**WRC-07**);
- aeronautical telemetry transmissions from aircraft stations (see No. **1.83**) in accordance with Resolution [**COM4/7**] (**WRC-07**);
- aeronautical security transmissions. Such use shall be in accordance with Resolution [**COM4/8**] (**WRC-07**). (WRC-07)

ADD COM4/380/7 (B17/404/14)

5.4B04 *Additional allocation:* in Region 1 (except in Algeria, Saudi Arabia, Bahrain, Egypt, United Arab Emirates, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Syrian Arab Republic, Sudan and Tunisia) and in Brazil, the band 5 150-5 250 MHz is also allocated to the aeronautical mobile service on a primary basis, limited to aeronautical telemetry transmissions from aircraft stations (see No. **1.83**), in accordance with Resolution [**COM4/7**] (**WRC-07**). These stations shall not claim protection from other stations operating in accordance with Article 5. No. **5.43A** does not apply. (WRC-07)

MOD COM4/380/8 (B17/404/15)

5.446A The use of the bands 5 150-5 350 MHz and 5 470-5 725 MHz by the stations in the mobile, except aeronautical mobile, service shall be in accordance with Resolution **229 (WRC-03)**. (WRC-07)

MOD COM5/264/66 (B6/268/72) (R3/292/74)

5.447 *Additional allocation:* in Côte d'Ivoire, Israel, Lebanon, Pakistan, the Syrian Arab Republic and Tunisia, the band 5 150-5 250 MHz is also allocated to the mobile service, on a primary basis, subject to agreement obtained under No. **9.21**. In this case, the provisions of Resolution **229 (WRC-03)** do not apply. (WRC-07)

MOD COM5/264/67 (B6/268/73) (R3/292/75)

5.447E *Additional allocation:* The band 5 250-5 350 MHz is also allocated to the fixed service on a primary basis in the following countries in Region 3: Australia, Korea (Rep. of), India, Indonesia, Iran (Islamic Republic of), Japan, Malaysia, Papua New Guinea, the Philippines, Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam. The use of this band by the fixed service is intended for the implementation of fixed wireless access systems and shall comply with Recommendation ITU-R F.1613. In addition, the fixed service shall not claim protection from the radiodetermination, Earth exploration-satellite (active) and space research (active) services, but the provisions of No. **5.43A** do not apply to the fixed service with respect to the Earth exploration-satellite (active) and space research (active) services. After implementation of fixed wireless access systems in the fixed service with protection for the existing radiodetermination systems, no more stringent constraints should be imposed on the fixed wireless access systems by future radiodetermination implementations. (WRC-07)

MOD COM4/296/2 (B9/305/7) (R4/335/7)

4 800-5 570 MHz

Allocation to services		
Region 1	Region 2	Region 3
4 800-4 990	FIXED MOBILE MOD 5.442 ADD 5.4B01 Radio astronomy 5.149 5.339 5.443	

MOD COM4/380/1 (B17/404/8)

4 800-5 570 MHz

Allocation to services		
Region 1	Region 2	Region 3
5 030-5 091	AERONAUTICAL RADIONAVIGATION 5.367 MOD 5.444	

MOD COM4/380/2 (B17/404/9)

4 800-5 570 MHz

Allocation to services		
Region 1	Region 2	Region 3
5 091-5 150	AERONAUTICAL RADIONAVIGATION AERONAUTICAL MOBILE ADD 5.4B03 5.367 MOD 5.444 MOD 5.444A	

MOD COM4/380/3 (B17/404/10)

4 800-5 570 MHz

Allocation to services		
Region 1	Region 2	Region 3
5 150-5 250	AERONAUTICAL RADIONAVIGATION FIXED-SATELLITE (Earth-to-space) 5.447A MOBILE except aeronautical mobile MOD 5.446A 5.446B 5.446 5.447 5.447B 5.447C ADD 5.4B04	

MOD COM5/264/68 (B6/268/74) (R3/292/76)

5.454 *Different category of service:* in Azerbaijan, the Russian Federation, Georgia, Mongolia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 5 670-5 725 MHz to the space research service is on a primary basis (see No. **5.33**). (WRC-07)

MOD COM5/264/69 (B6/268/75) (R3/292/77)

5.455 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Cuba, the Russian Federation, Georgia, Hungary, Kazakhstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 5 670-5 850 MHz is also allocated to the fixed service on a primary basis. (WRC-07)

MOD COM4/296/3 (B9/305/9) (R4/335/9)

5 570-7 250 MHz

Allocation to services		
Region 1	Region 2	Region 3
5 925-6 700	FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B MOBILE ADD 5.4B02 5.149 5.440 5.458	

ADD COM4/296/6 (B9/305/10) (R4/335/10)

5.4B02 In Region 2 (except Brazil, Cuba, French Overseas Departments and Communities, Guatemala, Paraguay, Uruguay and Venezuela), the band 5 925-6 700 MHz may be used for aeronautical mobile telemetry for flight testing by aircraft stations (see No. **1.83**). Such use shall be in accordance with Resolution [COM4/2] (WRC-07) and shall not cause harmful interference to, nor claim protection from, the fixed-satellite and fixed services. Any such use does not preclude the use of these bands by other mobile service applications or by other services to which these bands are allocated on a co-primary basis and does not establish priority in the Radio Regulations. (WRC-07)

RESOLUTION [COM4/2] (WRC-07)

Use of the bands 4 400-4 940 MHz and 5 925-6 700 MHz by an aeronautical mobile telemetry application in the mobile service

The World Radiocommunication Conference (Geneva, 2007),

considering

- a) that there is a need to provide global spectrum to the mobile service for wideband aeronautical mobile telemetry (AMT) systems;
- b) that studies have been conducted within ITU-R concerning the sharing and compatibility of AMT for flight testing with other services in the bands 4 400-4 940 MHz and 5 925-6 700 MHz;
- c) that based on the results of these studies, in the bands 4 400-4 940 MHz and 5 925-6 700 MHz, technical and operational measures applied to AMT for flight testing purposes facilitate sharing with other services and applications in these bands;
- d) that spectrum efficiency is enhanced in situations where new applications can be implemented compatibly in bands that are heavily occupied;

- e)* that there is extensive deployment of fixed-satellite service (FSS) earth stations in the band 5 925-6 425 MHz and to a lesser extent in the band 6 425-6 700 MHz;
- f)* that there is extensive deployment of fixed service stations in the bands 4 400-4 940 MHz and 5 925-6 700 MHz;
- g)* that in certain locations, availability of spectrum will be limited due to its extensive use by the various services while in other locations, this may not be the case;
- h)* that there are various techniques which can enhance sharing between co-primary services such as frequency or geographic separation;
- i)* that WRC-07 has adopted Nos. **5.4B01** and **5.4B02**,

recognizing

- a) that the bands 4 400-4 500 MHz and 4 800-4 940 MHz are allocated to the fixed and mobile services on a primary basis;
- b) that the band 4 500-4 800 MHz is allocated to the fixed, fixed-satellite (space-to-Earth), and mobile services on a co-primary basis;
- c) that the band 4 800-4 990 MHz is allocated to the radio astronomy service on a secondary basis worldwide and that No. **5.149** applies;
- d) that the band 4 825-4 835 MHz referred to in *recognizing c)* is allocated on a primary basis to radio astronomy in Argentina, Australia and Canada (see No. **5.443**);
- e) that No. **5.442** applies to AMT for flight testing operations in the band 4 825-4 835 MHz;
- f) that the band 5 925-6 700 MHz is allocated to the fixed, fixed-satellite (Earth-to-space), and mobile services on a co-primary basis;
- g) that the use of the band 4 500-4 800 MHz (space-to-Earth) by the FSS shall be in accordance with the provisions of Appendix **30B** (see No. **5.441**);
- h) that provisions for the coordination of terrestrial and space services exist in the Radio Regulations,

resolves

1 that, in the bands 4 400-4 940 MHz and 5 925-6 700 MHz, administrations authorizing AMT for flight test purposes per Nos **5.4B01**, **5.442** and **5.4B02** shall utilize the criteria set forth below:

- emissions limited to transmission from aircraft stations only, see No. **1.83**;
- in these bands, AMT in the aeronautical mobile service is not considered an application of a safety service as per No. **1.59**;
- the peak e.i.r.p. density of a telemetry transmitter antenna shall not exceed -2.2 dB(W/MHz);
- transmissions limited to designated flight test areas, where flight test areas are airspace designated by administrations for flight testing;
- if operation of AMT aircraft stations is planned within 500 km of the territory of an administration in which the band 4 825-4 835 MHz is allocated to radio astronomy on a primary basis (see No. **5.443**), consult with that administration to determine whether any special measures are needed to prevent interference to their radio astronomy observations;
- in the bands 4 400-4 940 MHz and 5 925-6 700 MHz, bilateral coordination of transmitting AMT aircraft stations with respect to receiving fixed or mobile stations must be effected if the AMT aircraft station will operate within 450 km of the receiving fixed or mobile stations of another administration. The following procedure should be used to establish whether a fixed or mobile service receiver within 450 km of the flight test area will receive an acceptable level of interference:

- determine if the receiving fixed or mobile station's antenna main-beam axis, out to a distance of 450 km, passes within 12 km of the designated area used by transmitting AMT aircraft stations, where this distance is measured orthogonally from the main-beam axis projection on the Earth's surface to the nearest boundary of the projection of the flight test area on the Earth's surface;
- if the main-beam axis does not intersect the flight test area or any point within the 12 km offset, the interference could be accepted. Otherwise, further bilateral coordination discussions would be needed;

2 that administrations authorizing AMT per Nos **5.4B01**, **5.442** and **5.4B02** in the bands 4 400-4 940 MHz and 5 925-6 700 MHz require the use of technical and/or operational measures on AMT where appropriate to facilitate sharing with other services and applications in these bands.

RECOMMENDATION [COM4/C] (WRC-07)

Future IMT systems

The World Radiocommunication Conference (Geneva, 2007),

considering

- a)* that the future development of IMT is being studied by ITU-R in accordance with Recommendation ITU-R M.1645 and further Recommendations are to be developed for IMT-Advanced;
- b)* that the future development of IMT is foreseen to address the need for higher data rates than those of currently deployed IMT systems;
- c)* the need to define the requirements associated with ongoing enhancement of future IMT systems,

noting

- a)* the ongoing relevant studies by ITU-R on IMT-Advanced, in particular the outputs from Question ITU-R 229-1/8;
- b)* the need to take into consideration requirements of applications of other services,

recommends

to invite ITU-R to study as necessary technical, operational and spectrum related issues to meet the objectives of future IMT systems.
