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| **U.S. Radiocommunications Sector****Fact Sheet** |
| **Working Party:** ITU-R WP 5B | **Document No:** USWP5B26-24 |
| **Ref:** AI 1.4 of WRC-23 (Resolution 247) | **Date:** 9 March 2021 |
| **Document Title:** Working document toward PDN Recommendation ITU-R M.[AMS-CHARACTERISTICS 1750-1850 MHz] |
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| **Purpose:** To initiate work towards developing sharing characteristics for AI 1.4 studies resulting in a new Recommendation ITU-R M.[AMS-CHARACTERISTICS\_1750-1850 MHz]. |
| **Abstract:** WRC-19 approved AI 1.4 for the WRC-23 agenda, which is to conduct sharing studies between High Altitude Platform Stations as IMT Base Stations (HIBS) and existing services in a number of frequency bands. Among the frequency bands under study for WRC-23 AI 1.4, there are no ITU-R Recommendations available for Aeronautical Mobile Services in band on 1750-1850 MHz. This contribution initiates the effort on developing a working document toward PDNRecommendation ITU-R M.[AMS-CHARACTERISTICS\_1750-1850 MHz] and provide a draft liaison statement to inform WP 5D of the Working Document. |
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| **Radiocommunication Study Groups** |  |
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| **English only** |
| **United States of America** |
| working document toward PDN Recommendation ITU-R M.[AMS-CHARACTERISTICS\_1750-1850 MHz]. |

**1 Introduction**

The United States of America would like to propose a working document toward PDN Recommendation ITU-R M.[AMS-CHARACTERISTICS\_1750-1850 MHZ] to update the use of the band with the latest radar technical characteristics.

Annex 1 contains the technical characteristics for the Aeronautical Mobile Service in the 1750-1850 MHz.

Annex 2 contains a draft liaison statement from WP 5B to WP 5D for WRC-23 agenda item 1.4.

Attachment revisions are presented for consideration.

RECOMMENDATION ITU-R M.[AMS Characteristics\_1 750-1 850 MHz]

Technical characteristics and protection criteria for the aeronautical mobile service systems operating within the 1 750-1 850 MHz frequency range

Scope

This Recommendation provides information on the technical characteristics and protection criteria for systems operating in the aeronautical mobile service (AMS) planned to or currently operating within the frequency range 1 750-1 850 MHz for use in sharing and compatibility studies as needed, including aeronautical mobile telemetry system.

Keywords

Aeronautical mobile service, technical characteristics, protection criteria

Abbreviations/Glossary

ADL Aeronautical mobile service data link

AMS Aeronautical mobile service

AMT Aeronautical mobile telemetry

The ITU Radiocommunication Assembly,

considering

*a)* that systems and networks operating in the aeronautical mobile service (AMS) are used for broadband, airborne data-links to support remote sensing, e.g. earth sciences, land management, energy distribution, etc., applications;

*b)* that systems and networks operating in AMS are also used for narrow-band, airborne data-links;

*c)* that the physics of the propagation of electromagnetic energy, the availability of hardware components, etc., within the 1 750-1 850 MHz frequency range facilitates the use of current or planned operating systems and networks for such applications;

recognizing

*a)* that the frequency range 1 750-1 850 MHz is allocated on a primary basis in all three ITU regions to the Fixed, mobile service;

*b)* that other radio services are allocated on either a primary or secondary basis in all or parts of the frequency range 1 750-1 850 MHz all three ITU regions;

*c)* that technical characteristics and protection criteria for aeronautical mobile telemetry systems are contained in this Recommendation;

recommends

**1** that the technical characteristics and protection criteria for systems operating in the AMS given in the Annex 1 should be used in performing sharing and compatibility analyses.

**2** that the following Note is considered as part of this Recommendation.

# 1 Introduction

Systems and networks operating in the AMS are used for broadband, airborne data-links to support remote sensing, etc., applications. Aeronautical mobile data links are operated between ground stations and aircraft stations, or between aircraft stations equipped with AMS data links (ADL).

Annex 1 decribes the technical characteristics of aerunatical data links (ADL).

Annex 1

Technical characteristics and protection criteria of AMS data links (ADL)

# 1 Operational deployment for AMS data links (ADL)

Aeronautical mobile data links are operated between ground stations and aircraft stations, or between aircraft stations equipped with AMS data links (ADL) and can be deployed anywhere within a country whose administration has authorized their use in accordance with regulations.

ADL includes transmission from and to, either aircraft stations or a ground terminal considered as an aeronautical station. These transmissions could use bidirectional air‑to‑ground links, or relay through another airborne platform using an air‑to‑air data link. Links can be either simplex or duplex. The link lengths vary greatly in these applications. Although some of the link lengths may be relatively short, many of the link lengths approach the radio line‑of‑sight distance. The operational altitude of airborne platforms equipped with these ADLs can vary up to [15,000]m.

The ground terminals may be at a permanent location or they may be transportable. Transportable ground terminals can be moved to meet operational needs and the duration of use while it remains at a particular location is dependent upon operational requirements.

A single ground terminal may simultaneously support several aircraft stations at the same time via different links.

# 2 Technical characteristics of aeronautical mobile systems

Typical technical characteristics for representative airborne data links for the frequency range 1 750-1 850 MHz are provided in Table 1.

## 2.1 Transmitter and receiver characteristics

The aeronautical mobile systems operating or planned to operate within the frequency range 1 750-1 850 MHz typically use digital modulations. A given transmitter may be capable of radiating more than one waveform.

## 2.2 Antenna characteristics

A variety of different types of antennas are used by systems in the frequency range 1 750-1 850 MHz. Antennas in this range are generally of a variety of sizes and vary between the airborne component of the link and the ground based component of the link. The airborne antenna gains are typically [3] dBi. The ground based antenna gain is typically [13] dBi.

# 3 Protection criteria

An *I/N* ratio of about −6 dB is protection criteria for AMS systems. This represents the required protection criterion for the AMS systems referenced herein from interference due to another radiocommunication service. If multiple potential interference sources are present, protection of the AMS systems requires that this criterion is not exceeded due to the aggregate interference from the multiple sources.

TABLE 1

Typical technical characteristics of representative aeronautical mobile service systems operated in the frequency range 1 750-1 850 MHz

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Units | System 1AAirborne | System 1BGround |
| Tuning range | MHz | 1 750-1 850  | 1 750-1 850  |
| Power output | dBm |  |  |
| Emission Bandwidth (3 dB) | MHz |  |  |
| Tuning range | MHz |  |  |
| IF Selectivity (3 dB) | MHz |  |  |
| Noise figure | dB |  |  |
| Thermal noise level | dBm |  |  |
| Antenna type |  |  |  |  |
| Antenna gain | dBi |  |  |  |
| 1st sidelobe | dBi |  |  |  |
| Polarization |  |  |  |  |
| Antenna pattern |  |  |  |  |
| Horizontal beamwidth | Degrees |  |  |  |
| Vertical beamwidth | Degrees |  |  |  |
| Antenna height  | meters |  |  |  |
| I/N Protection Criteria | dB |  |  |  |

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| Annex 2Working Party 5B |
| Draft REPLY LIAISON STATEMENT to working party 5D |
| WRC-23 agenda item 1.4 Characteristics of radiodetermination systems operating in the frequency bands 1 750-1 850 MHz |

Working Party (WP) 5B thanks WP 5D for the liaison statement ([5B/142](https://www.itu.int/md/R19-WP5B-C-0142/en)). WP 5B has initiated the process of developing a Recommendation ITU-R M.[AMS-CHARACTERISTICS\_1750-1850 MHZ]. This Recommendation is intended to be used for sharing studies between High Altitude Platform for International Mobile Telecommunication Base Station (HIBS) and AMS operating in 1750-1850 MHz band under WRC-23 agenda item 1.4.

WP 5B would like to mention that it has considered the Administrative Circular [CACE/955](https://www.itu.int/md/R00-CACE-CIR-0955/en) dated 18 September 2020 which encourages administrations to provide their contributions on technical characteristics, operational parameters and protection criteria for services to support the work on relevant WRC-23 agenda items to the contributing Working Parties dealing with these services. WP 5B will take into account any additional information received from the membership related to this administrative circular as well as any other available information in the BR databases together with any information in ITU-R Recommendations and Reports and further liaise with the responsible or contributing groups by the requested deadline.

WP 5B looks forward to continued collaboration with WP 5D on the progress of WRC-23 agenda item 1.4.

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| **Status:** For information and action as appropriate |
| **Contact:**  | **E-mail:**   |