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| U.S. Radiocommunications SectorFact Sheet |
| **Working Party:** ITU-R WP 5B | **Document No:** USWP5B35-10 |
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| **Document Title:** Preliminary Draft New Recommendation ITU-R M.[AMRS-VDL], “Characteristics and protection criteria for the International Civil Aviation Organization standardized VHF datalink Mode 2 systems operating in the aeronautical mobile (route) service in the frequency band 136-137 MHz” |
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| **Purpose/Objective:** The purpose of this contribution is to elevate this Preliminary Draft New Recommendation to Draft New Recommendation. |
| **Abstract:** This Recommendation provides the technical characteristics and protection criteria for the International Civil Aviation Organization (ICAO) standardized VHF datalink (VDL) Mode 2 (VDL Mode 2) communications systems operating in the aeronautical mobile (route) service (AM(R)S) in the frequency band 136-137 MHz. The purpose of this contribution is to elevate this Preliminary Draft New Recommendation to Draft New Recommendation. |

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| **Radiocommunication Study Groups** |  |
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| English only |
| United States of America |
| PRELIMINARY DRAFT NEW RECOMMENDATION ITU-R M. [AMRS-VDL] |
| Characteristics and protection criteria for the International Civil Aviation Organization standardized VHF datalink Mode 2 systems operating in the aeronautical mobile (route) service in the frequency band 136-137 MHz |

Introduction

This contribution proposes to elevation the Preliminary Draft New Recommendation ITU-R M.[AMRS-VDL], “Characteristics and protection criteria for the International Civil Aviation Organization standardized VHF datalink Mode 2 systems operating in the aeronautical mobile (route) service in the frequency band 136-137 MHz” to the Draft New Recommendation.

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| ATTACHMENT |
| DRAFT NEW RECOMMENDATION ITU-R M. [AMRS-VDL] |
| Characteristics and protection criteria for the International Civil Aviation Organization standardized VHF datalink Mode 2 systems operating in the aeronautical mobile (route) service in the frequency band 136-137 MHz |

(202X)

**Scope**

This Recommendation provides the technical characteristics and protection criteria for the International Civil Aviation Organization (ICAO) standardized VHF datalink (VDL) Mode 2 (VDL Mode 2) communications systems operating in the aeronautical mobile (route) service (AM(R)S) in the frequency band 136-137 MHz. These technical characteristics and protection criteria should be used for sharing and compatibility studies with VDL Mode 2 systems.

**Keywords**

AM(R)S, VHF, VDL, protection criteria, air-to-ground communications, ground-to-air communications

**Abbreviations/Glossary**

AM(R)S: Aeronautical mobile (route) service

ICAO: International Civil Aviation Organization

VDL Mode 2: VHF data link mode 2

VHF: Very high frequency

RR: Radio Regulations

**Related ITU Recommendations and Reports**

*Recommendation*

[ITU-R SM.1535](https://www.itu.int/rec/R-REC-SM.1535/en) The protection of safety services from unwanted emissions

The ITU Radiocommunication Assembly,

*considering*

*a)* that the frequency band 136-137 MHz is currently used by International Civil Aviation Organization (ICAO)-standardized VHF data link Mode 2 (VDL Mode 2) data communications worldwide for air-to-ground, air-to-air, and ground-to-air aeronautical safety communications;

*b)* that aeronautical safety communications are used in all areas that aircraft operate and land, and in all phases of flight;

*c)* that aircraft may be equipped with up to three aeronautical mobile (route) service (AM(R)S) radio stations utilizing a combination of voice and data radios,

*recognizing*

*a)* that in high aircraft density areas, such as in Europe and North America, the utilization of VHF channels in the 117.975-137 MHz is highly congested;

*b)* that the ICAO develops standards and recommended practices for civil aviation;

*c)* that Annex 10 to the Convention on International Civil Aviation contains standards and recommended practices for aeronautical radiocommunication systems used by civil aviation;

*d)* that the AM(R)S is a safety service;

*e)* that No. **4.10** of Radio Regulations stipulates “Member States recognize that the safety aspects of radionavigation and other safety services require special measures to ensure their freedom from harmful interference; it is necessary therefore to take this factor into account in the assignment and use of frequencies”;

*f)* that Recommendation ITU-R SM.1535 provides a guideline for the protection of safety services from unwanted emissions,

*recommends*

1 that the technical and operational characteristics of the VDL Mode 2 systems operating in the 136-137 MHz frequency band, allocated to the AM(R)S and described in Annex 1, should be considered for sharing and compatibility studies;

2 that the criterion of interfering signal power to receiver noise power level, *I/N = −6 dB[[1]](#footnote-1)*, should be considered to protect the VDL Mode 2 systems operating in the AM(R)S in the frequency range 136-137 MHz, and that this represents the aggregate protection level if multiple interferers are present.

Annex 1

**Technical and operational characteristics of the VHF datalink mode 2 systems operating in the aeronautical mobile (route) service
in the frequency band 136-137 MHz**

**A1.1 Introduction**

The frequency band 136-137 MHz is allocated to the AM(R)S and is one of the communications band for aeronautical safety data communications in the air-to-ground, air-to-air, and ground-to-air directions. These systems are internationally standardized by the ICAO for VDL Mode 2. These communications are used where air traffic services are available and in all phases of flight.

**A1.2 Technical characteristics of the VHF datalink mode 2 systems operating in the aeronautical mobile (route) service in the frequency band 136‑137 MHz**

The technical characteristics of representative VDL Mode 2 systems operating in the frequency band 136-137 MHz are presented in Table A1-1. Some stations use different antennas to transmit and to receive signals.

Table A1-1

**Characteristics of VHF data link mode 2 systems operating in the frequency band 136-137 MHz**

| **Platform** | **Units** | **Aircraft** | **Base station** |
| --- | --- | --- | --- |
| Type of emission |  | Data | Data |
| Modulation type |  | D8PSK | D8PSK |
| Type of operation |  | Simplex | Simplex |
| Max antenna height | m | 15 240 (MSL) | 15-50 (AGL)(15 typical) |
| **Transmitter** |
| Power | W | 18 to 25 | Typical 25  |
| Coverage radius | km | 370 | 370 |
| Bandwidth | kHz | 25 | 25 |
| Antenna gain | dBi | 0 | 2.2 |
| Radiation pattern |  | Omni | Omni |
| Antenna polarization |  | Vertical | Vertical |
| Emission mask |  | ICAO SARPs, Annex 10, Vol. III, Part 1, Sections 6.3.3 (RR App. **3**) and 6.3.4 | ICAO SARPs, Annex 10, Vol. III, Part 1, Sections 6.2.3 (RR App. **3**) and 6.2.4 |
| **Receiver** |
| Noise figure | dB | 6 | 6 |
| IF bandwidth | kHz | 25 | 25 |
| Antenna gain | dBi | 0 | 2.2 |
| Radiation pattern |  | Omni | Omni |
| Antenna polarization |  | Vertical | Vertical |

1. This protection criterion does not include a safety margin. [↑](#footnote-ref-1)