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Maritime navigation and radiocommunication equipment and systems – Class B shipborne equipment of the automatic identification system (AIS) –

Part 1: Carrier-sense time division multiple access (CSTDMA) techniques

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MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – CLASS B SHIPBORNE EQUIPMENT OF THE AUTOMATIC IDENTIFICATION SYSTEM (AIS) –

Part 1: Carrier-sense time division multiple access (CSTDMA) techniques

FOREWORD

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International Standard IEC 62287-1 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

The text of this standard is based on the following documents:

FDIS	Report on voting
80/426/FDIS	80/434/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

IEC 62287 consists of the following parts, under the general title *Maritime navigation and radiocommunication and systems – Class B shipborne equipment of the automatic identification system (AIS)*

Part 1: Carrier-sense time division multiple access (CSTDMA) techniques

Part 2: Self-organising time division multiple access (SOTDMA) techniques

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

In the ITU Radiocommunications Sector Recommendation ITU-R M.1371-1 "Technical characteristics for a universal shipborne Automatic Identification System (AIS) using SOTDMA (Self-Organising Time Division Multiple Access) in the VHF maritime mobile band", provision is made for a Class B AIS for use on craft not covered by a mandatory carriage requirement under SOLAS Chapter V, Regulation 19. This part of IEC 62287 sets out the requirements, methods of test and required test results for such a Class B AIS.

The International Maritime Organization (IMO), in its Resolution MSC.140(76), recognised that the radio channels used by AIS, particularly AIS 1 (161,975 MHz) and AIS 2 (162,025 MHz), are regarded as an AIS network, and any disruption to those channels by any one AIS device could affect the operation of all AIS devices on that network. IMO also recognised that Administrations should take steps necessary to ensure the integrity of the radio channels used for AIS in their waters.

IEC Technical Committee 80 (TC 80) allocated a new work item 80/287/NP to Working Group 8a (WG 8a), tasking them with producing a test standard for Class B AIS equipment. During the development of this test standard, Administrations expressed concern that large numbers of Class B AIS equipped vessels could have a detrimental effect on the safe operation of the AIS network by SOLAS Class A vessels, Base Stations and AIS on Aids to Navigation (AtoN AIS). As a result, a new network access technology was developed, which allows large numbers of Class B fitted vessels to coexist with Class A with a negligible detrimental effect on AIS network.

The new technology, hereinafter referred to as “Carrier-Sense TDMA (CSTDMA)”, requires that the Class B“CS”AIS listens to the AIS network to determine if the network is free of activity and, only if the network is free, can it transmit its information. This Class B AIS is also required to listen for reservations from base stations and comply with these reservations. This polite operation ensures that this Class B AIS minimises the probability of interference with Class A, Base Station or AtoN AIS operations. Extensive computer models simulation and practical laboratory testing and sea trials were undertaken to validate CSTDMA during its development (see Annex A).

WG8a recognised that the primary function of a Class B AIS is for fitted vessels to be visible and participate in the AIS network. CSTDMA was designed to fulfil these requirements.

This Class B AIS is backward compatible with ITU-R Recommendation M.1371-1 (see Annex B).

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – CLASS B SHIPBORNE EQUIPMENT OF THE AUTOMATIC IDENTIFICATION SYSTEM (AIS) –

Part 1: Carrier-sense time division multiple access (CSTDMA) techniques

1 Scope

This part of IEC 62287 specifies the minimum operational and performance requirements, methods of testing and required test results for Class B shipborne AIS equipment using CSTDMA techniques. This standard takes into account other associated IEC International Standards and existing national standards, as applicable.

It is applicable for AIS equipment used on craft that are not covered by the mandatory carriage requirement of AIS under SOLAS Chapter V.

An AIS station intended to operate in receive-only mode shall not be considered a Class B shipborne mobile AIS station.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60945, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results*

IEC 61108-1, *Maritime navigation and radiocommunication equipment and systems – Global navigation satellite systems (GNSS) – Part 1: Global positioning system (GPS) – Receiver equipment – Performance standards, methods of testing and required test results*

IEC 61162 (all parts), *Maritime navigation and radiocommunication equipment and systems – Digital interfaces*

IEC 61993-1, *Maritime navigation and radiocommunication equipment and systems – Part 1: Shipborne automatic transponder system installation using VHF digital selective calling (DSC) techniques – Operational and performance requirements, methods of testing and required test results*

IEC 61993-2, *Maritime navigation and radiocommunication equipment and systems – Automatic identification systems (AIS) – Part 2: Class A shipborne equipment of the universal automatic identification system (AIS) – Operational and performance requirements, methods of test and required test results*

ISO/IEC 3309:1993, *Information technology – Telecommunications and information exchange between systems – High-level data link control (HDLC) procedures – Frame structure*

IMO MSC.140(76), *Recommendation for the protection of the AIS VHF data link*

ITU-R Recommendation M.493-11, *Digital selective-calling system for use in the maritime mobile service*

ITU-R Recommendation M.825-3, *Characteristics of a transponder system using digital selective calling techniques for use with vessel traffic services and ship-to-ship identification*

ITU-R Recommendation M.1084-4, *Interim solutions for improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service*

ITU-R Recommendation M.1371-1, *Technical characteristics for a universal shipborne automatic identification system using time division multiple access in the VHF maritime mobile band*

ITU-T Recommendation O.153, *Basic parameters for the measurement of error performance at bit rates below the primary rate*